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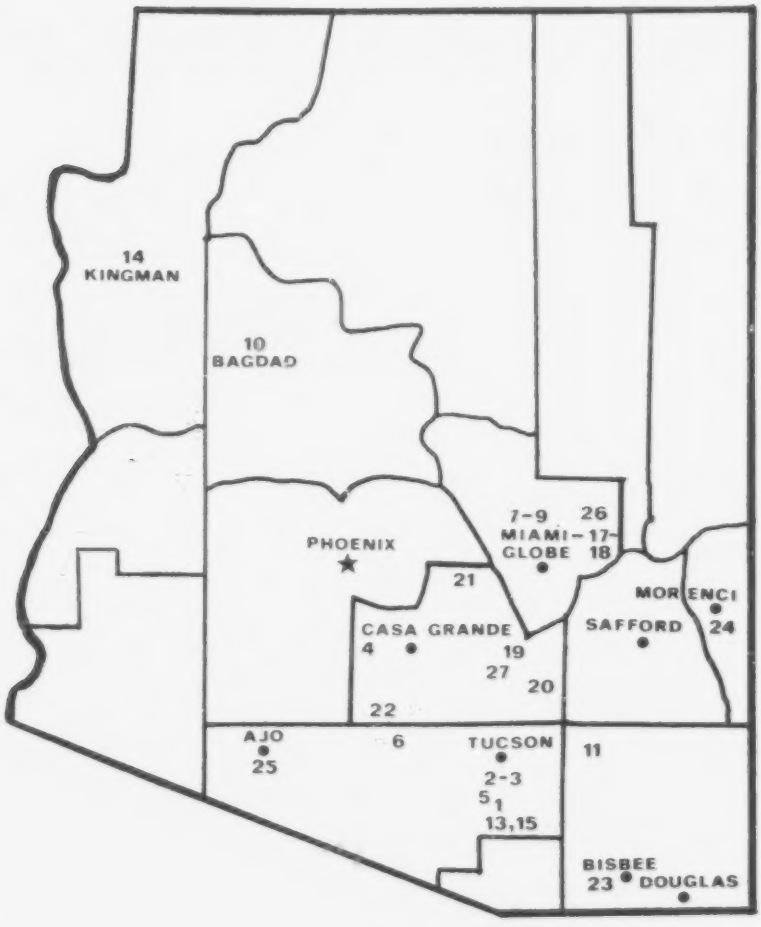
THE PRIMARY COPPER INDUSTRY OF ARIZONA IN 1983

SPECIAL REPORT NO. 8



BY

CLIFFORD J. HICKS
FIELD ENGINEER

ARIZONA DEPARTMENT OF
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ABOUT THE COVER

The producing copper mines and operations listed below correspond to the location and numbers on the cover.

COMPANY
#. Mine

ANAMAX MINING COMPANY
1. Twin Buttes
2. Eisenhower

ASARCO INCORPORATED
2. Eisenhower
3. Mission
4. Sacaton
5. San Xavier
6. Silver Bell

CITIES SERVICE COMPANY/PINTO VALLEY COPPER CORP.
7. Copper Cities Operations
8. Miami Mine
9. Pinto Valley

CYPRUS MINES CORP.
10. Bagdad
11. Johnson
12. Pima

DUVAL CORP.
13. Esperanza
14. Mineral Park
15. Sierrita

INSPIRATION CONSOLIDATED COPPER CO.
16. Christmas
17. Inspiration
18. Oxhide Mine

KENNECOTT CORPORATION
19. Ray

MAGMA COPPER CO.
20. San Manuel
21. Superior

NORANDA LAKESHORE MINES, INC.
22. Lakeshore

PHELPS DODGE CORP.
23. Copper Queen Branch
24. Morenci Branch
    Metcalf Mine
    Morenci Mine
25. New Cornelia

RANCHERS EXPLORATION & DEVELOPMENT CORP.
26. Bluebird
27. Old Reliable

ACKNOWLEDGEMENT

The author wishes to express appreciation to individual Arizona copper mining companies and Lorraine Burgin of the U.S. Bureau of Mines for providing production and other data.

Additionally, thanks are extended to Nyal Niemuth, Mineral Resources Specialist, Arizona Department of Mines and Mineral Resources for his valuable advice and assistance in the compilation of some of the contained tables.

To John H. Jett, Director, ADMMR, appreciation for the opportunity to compile data relative to Arizona's copper industry in 1983 and present it in convenient form.

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Special Report Number 8

By

Clifford J. Hicks, Field Engineer

January 1985

ARIZONA DEPARTMENT OF MINES & MINERAL RESOURCES

JOHN H. JETT, DIRECTOR

PHOENIX OFFICE

MINERAL RESOURCES BUILDING
FAIRGROUNDS
PHOENIX, ARIZONA 85007
(602) 255-3791

TUCSON OFFICE

STATE OFFICE BUILDING
416 W. CONGRESS, ROOM 161
TUCSON, ARIZONA 85701
(602) 628-5399

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INTRODUCTION

The Arizona Department of Mines and Mineral Resources presents herein a report covering activity in Arizona's copper industry in the calendar year 1983. A brief review of operational highlights reported by the major developers and producers in the State, market and price developments which affected copper production and discussions of Arizona inventory and severance taxes on metalliferous minerals are included.

The contained statistical tables include various production, employment, inventory, import/export, prices, costs and ore reserve numbers for 1983. Production of recoverable copper is given for individual mines and by company. Figures showing the importance of copper in the mining industry are furnished, as are data on the by-products of copper mining; gold, silver and molybdenum. In addition, historical compilations are included for leach copper, average grade of ore produced, percent copper recovered, open pit mine stripping ratios, and employment and earnings. Additional compilations indicating refined copper inventories in and out of the United States and average copper prices by month from 1973 through 1983 are provided. Also included are tables showing designed mine capacity and copper reserves in Arizona plus estimated international copper production pound costs.

The Department maintains extensive reference libraries in its Phoenix and Tucson offices concerning the copper industry in Arizona. These repositories include information on individual mines and mining companies, United States Bureau of Mines and United States Geological Survey publications, other professional publications and periodicals and earlier editions of this report. Additionally, experienced mining engineers are available for consultation, at no charge, on matters germane to the minerals industry. Office hours are 8 a.m. to 5 p.m. on all non-holiday weekdays.

COPPER PRODUCTION IN ARIZONA---1983

Arizona, in spite of production curtailments and mine closures, continued to lead the nation in the production of copper. In 1983 the state's mines produced 755,446 tons of recoverable copper, down 10% from 1982 production and 34% from the record 1981 production. This, however, was 65.5% of the United States total (Table XIII).

In 1983, the gross value of mineral production (excluding coal, natural gas and petroleum) in Arizona was $1,510,878,000 (preliminary). Of this total, copper production contributed almost 76% (Table XI). Other major contributors to the total value of mineral production in the state included molybdenum (5%), gold and silver. Virtually all the molybdenum and most gold and silver are byproducts of the treatment of copper ores (Table X). As a result, Arizona ranks third in the United States production of silver and fifth in the production of gold in 1983.

Copper was produced in 20 major Arizona copper mines in 1983. Molybdenum was recovered as a by-product at 8 of the copper mines during the year (Table I). Ten mines produced 89.13% of Arizona's 1983 copper output and three produced 92.4% of the molybdenum. The four largest producers, Morenci-Metcalf, San Manuel, Inspiration and Bagdad, in descending order of productivity, accounted for more than 58% of the total copper recovered. The Morenci-Metcalf mines of the Phelps Dodge Corporation, now statistically united, led copper production with 23.5% of the total and Duval's Sierrita mine produced over 61% of the state's by-product molybdenum.

Copper produced by leaching methods during 1983 was slightly over 255 million pounds, down 15% from 1982 and accounted for 18.8% of total primary production (Table II).

Out of the seven solvent extraction/electrowinning copper recovery plants in Arizona, six operated during 1983. Solvent extraction uses a liquid ion-exchange process to increase the copper concentration of the solvent solution from which the copper is then recovered by electrolytic deposition. Some of the advantages of solvent extraction over the cementation process are: no air pollution is produced, there is a net reduction in energy costs, and the end product is high grade cathode copper which can be marketed directly.

There were thirteen open pit copper mines operating in the state in 1983. The stripping ratios--the amount of waste removed compared to the amount of ore mined---at these operations for the past decade are presented in Table VIII. The excessively low 1983 weighted average stripping ratio (0.57:1) reflects producers' efforts to reduce mining costs by stripping no more waste than that essential to maintain production. In the future stripping ratios can be expected to increase when the copper market recovers and mining operations become profitable.

Copper sulfide ores were the source of 82.8% of the copper produced in 1983. The average sulfide ore has averaged 0.596% Cu from 1973 through 1983. 1983's weighted average sulfide grade was 0.65% Cu which indicates that somewhat higher grade ore was selectively mined during that recession year (Table VI).

Table XII shows an estimate of the capacity to produce primary copper at each of the state's principle operations. Total estimated design capacity is 1.248 million tons annually. The Arizona mines, their concentrators and leach plant facilites operated at 60.7% of estimated capacity during 1983.

Employment in Arizona's copper industry was 13,864 persons during 1983. That was a decrease of almost 20% from the previous year and the lowest number since 1967 (Table XVII). However, worker productivity and average hourly earnings increased (Table XIX). The aggregate man-hours worked dropped 24%. The Arizona production worker's average hourly production of ore was 8.356 tons, 2.29 tons more than in 1982, while the average hourly production of copper was 82.766 pounds, an increase of 10.34 pounds. Earnings of the production workers rose $0.34 to an average hourly rate of $13.28, an increase of 2.6% (Table XIX).

In addition to the world-wide recession, albeit receding in 1983, and low priced foreign competition, many factors affect the production of copper in Arizona. Most technological factors are so interwoven that to isolate one and describe its impact is extremely difficult and often misleading. An even more difficult task is to properly evaluate the rapidly enlarging scope of economic and socio-political factors that influence daily the decisions made by developers and producers of copper. Foremost in any consideration of production capacity is the availability of deposits of copper mineralization. A list of most of Arizona's rich endowment of copper reserves is given in Table XXIII.

It should be emphasized that, although the reserves listed in Table XXIII totals billions of tons of ore, the number can move upward or downward drastically with market price, improved technology or changes in U.S. policy or economy. If, for example, socio-political factors such as capricious rules and regulations imposed by governments become too burdensome, many of these deposits may never be developed and some exisiting mines may be closed. One must never lose sight of the fact that the word "ore" is not a geological or mineralogical term but simply an expression of economic value. If rock containing a marketable commodity can be mined, processed, and transported and the commodity marketed <u>at a profit</u> then the rock is ore--if not, it is mineralized waste. However, some copper mines have been producing and selling copper for prices under cost because it is, in some instances, more economical to maintain some production than to mothball the operations.

A BRIEF REVIEW OF THE 1983 COPPER MARKET

"The U.S. economic recovery in 1983 affected primarily the consumer goods sectors, while capital spending, which in normal years may account for almost two-thirds of copper consumption, remained near its 1982 recession level. However, domestic copper consumption in 1983 increased over the 1982 level."

"On the supply side, domestic copper producers, encouraged by the improving economy in the first half of 1983, restored production at some of the mines which had been closed or curtailed in 1982. Nevertheless, U.S. mine output in 1983 was almost 10% below the 1982 level, which had been more than 25% below 1981 production."

"Copper consumption outside the U.S. remained at or below 1982's recession lows. Most other Free World economics did not participate in the economic recovery to any significant degree. However, state-owned copper producers in the developing countries, which now account for 40% of Free World production, did not adjust production levels to match the reduced demand in their traditional markets in Europe, Asia and South America and continued to maximize copper output. Much of this excess production was diverted to the U.S. causing a large oversupply in the domestic market."

"The worldwide imbalance between supply and demand caused the most copper stocks, those of the commodity exchanges in New York and London, to increase by nearly 350,000 tons in 1983. However, this increase was partly offset by drawdowns of producer stocks, and the net increase was approximately 150,000 tons of refined copper. Following a 300,000 ton increase in 1982, the 1983 rise brought worldwide copper stocks considerably above normal levels."

"By the end of 1983, there were signs of improved capital spending in the U.S. and of early stages of recovery in other major Free World economies. Demand for copper had improved sufficiently to slow the growth of copper stocks on the terminal exchanges to a rate more than offset by declining producer inventories. However, a substantial recovery in copper prices is not likely to occur until some of the excess stocks are consumed."

Source: ASARCO Incorporated Annual Report 1983.

HIGHLIGHTS OF COMPANY OPERATIONS IN ARIZONA

ANAMAX MINING COMPANY

Anamax Mining Co. is an equal partnership between Anaconda Minerals Company, a wholly owned subsidiary of the Atlantic Richfield Company and AMAX Incorporated. The company operates the Twin Buttes open-pit mine and controls the Palo Verde ore reserves under a lease from the State of Arizona. An agreement is in effect with ASARCO Incorporated for mining the Palo Verde deposit. Anamax is an equal partner with ASARCO in the Eisenhower Mining Company which mines the Palo Verde deposit. Anamax's share of Eisenhower ore is processed at the Twin Buttes mill.

"Under the terms of a consent order issued by the Federal Trade Commission on October 29, 1979, in an administrative proceeding in which it had challenged the acquisition of common stock of the Anaconda Company by Atlantic Richfield and the subsequent merger between the companies, the Company is required to divest most of its interest in Anamax by October 1984 and has been seeking a buyer for its interest. Should the Company's interest in Anamax not be sold by October 1984, the consent order provides for the appointment of a trustee with concurrent authority to solicit for the sale of the interest at fair value during the following three years. Anamax suspended sulfide mining at the Twin Buttes mine on January 31, 1983." 1/ The Eisenhower mine operations shut down July 31, 1983 because of a labor dispute and remained closed for the remainder of the year.

CYPRUS MINES CORPORATION

Cyprus Mines Corporation is a wholly owned subsidiary of the Standard Oil Company of Indiana. Cyrpus' operations include the Bagdad, Johnson and Pima open pit operations and the Cyprus Metallurgical Processes Corporation in Tucson.

During 1981, Cyprus Mines Corporation acquired Union Oil's 25% interest in the Pima Mine. Cyprus Mines now owns 75.01% of Pima with Utah International (wholly owned by the General Electric Company) remaining the sole non-operating partner with a 24.99% share. As a result of depressed copper prices all mining and milling operations at Cyprus Pima were halted October 1, 1982 and remained closed all of 1983.

Production at Cyprus Bagdad was reduced in the first and last quarters of 1983 and Cyprus Johnson stripping and mining was reduced.

Total 1983 copper production was down 23%.

1/ Atlantic Richfield Company Annual Report on Form 10-K, 1983, pp. 7-8.

ASARCO INCORPORATED

ASARCO owns and operates four open pit mines in Arizona: Mission, Sacaton, San Xavier and Silver Bell. The Silver Bell mine was closed in December 1981 and remained shut down all of 1982 except for a small copper leaching operation, however, ASARCO reopened it in September 1983 in anticipation of exhaustion of ore reserves at the Sacaton mine by mid-1984 and a shortage of concentrates for the Hayden smelter. The Eisenhower open pit mine is operated and partially owned by ASARCO. The company's share of Eisenhower ore is processed with ore from the San Xavier and Mission mines at the Mission concentrator, however, production at the Eisenhower mine was curtailed on August 1, 1983 as a result of a strike against ASARCO's partner in the mine, Anamax Mining Company. Other ASARCO operations in the state include a smelter and acid plant at Hayden and the development of an underground project at Sacaton. Because of high development costs and a weak copper market, work on this mine was suspended in September 1981 and remained shut down throughout 1982 and 1983.

"Cost reduction continued to be a high priority at all of ASARCO's open pit copper mines in Arizona. At the Mission Unit, comprising the Mission, San Xavier and Eisenhower mines, total manpower was reduced 27%, principally by deferring stripping of overburden from the ore bodies. Sacaton reduced employment approximately 18% as manpower requirements declined due to the forthcoming termination of operations. Silver Bell resumed production with 16% fewer employees than prior to the shutdown as a result of not restarting the molybdenum recovery plant and because of other planned reductions." 1/

"ASARCO reached agreements with unions at its copper mines and plants on new three-year contracts commencing July 1, 1983. The contracts provide for no increase in wages, retention of the cost-of-living adjustment, and revisions to certain benefit programs which will reduce their costs." 1/

"Output at the Hayden copper smelter in Arizona was affected by curtailments necessary to permit installation of the new oxygen flash smelting furnace. Initial construction on the new furnace was completed in October (1983) on schedule and under its $132.6-million budget. It started up in November and was into its shakedown period at year-end. ASARCO expects to have the new facilities at Hayden in full operation by April 1984." 1/

DUVAL CORPORATION

Duval is a wholly owned subsidiary of the Pennzoil Company. Duval's Arizona operation consists of the Esperanza and Mineral Park open pit mines, concentrators and precipitation plants, the Sierrita open pit mine and concentrator, a ferro-molybdenum plant the the CLEAR (Copper Leach, Electrolysis and Regeneration) plant adjacent to Sierrita which utilizes non-polluting hydrometallurgical technology to turn copper concentrate into high grade crystals (equivalent to a high grade blister copper) electrolytically. The CLEAR-process plant was temporarily shut down in April 1982 for modification of the electrolytic cells and remained closed at year end 1983.

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1/ ASARCO Annual Report, 1983. pp. 6-7.

Duval Corporation
continued

During 1982 and 1983 Duval's two smallest copper/molybdenum mines (Esperanza and Mineral Park) were closed and produced only precipitate copper. The large open pit Sierrita Mine which had been shut down since December 14, 1981, was reopened April 1, 1982 at reduced production rates and with a greatly reduced work force. At the end of 1983, production rates at Sierrita were approximately 90% of capacity. Union workers at Sierrita did not renew labor contracts upon expiration September 30, 1983. However, work was continued almost uninterrupted and with essentially the same work force as before the strike.

An innovative movable in-pit ore crushing and conveying system was on stream at Sierrita in early 1983. The system, which is the United State's first large capacity movable crushing system, can be moved to various sites within the pit by a track-type transporter as mining progresses. Crushed ore is then carried out of the mine by a conveyor system rather than trucks, resulting in a reduction in cost.

EISENHOWER MINING COMPANY

The Anamax Mining Company and ASARCO Incorporated are equal partners in the Eisenhower Mining Company which was formed to develop the Palo Verde deposit. Mining of the deposit under the joint venture agreement is expected to reduce operating costs greatly for both companies and to lengthen the life of the Mission and San Xavier Mines significantly by eliminating some pit slopes and recovering ore that would ordinarily have to be left along property lines. The agreement contains provisions governing the amount of ore each partner will receive, the timing of ore delivery and allocation of costs between the partners.

ASARCO is the mine operator and its share of the ore is processed into concentrates at the Mission mill. Anamax's share of the ore is crushed near the mine and sent 6¼ miles by belt conveyor to be processed at the Twin Buttes mill.

INSPIRATION CONSOLIDATED COPPER COMPANY/INSPIRATION MINES INC.

As the result of a reorganization effective July 6, 1983, Inspiration Consolidated Copper Co./Inspiration Mines Inc., became a unit of a parent holding company, Inspiration Resources Corporation (formerly Plateau Holdings Inc.). Inspiration Consolidated Copper/Inspiration Mines conducts Inspiration Resources United States' metals business, while another unit, Hudson Bay Mining and Smelting Co., Ltd. now operates their Canadian metals business.

The company's operations in the Miami, Arizona area include the Inspiration area open-pit mine (Joe Bush, Live Oak, Red Hill and Thornton); a concentrator;

-continued-

Inspiration Consolidated Copper
continued

a ferric cure leaching solvent extraction electrowinning plant; the Ox Hide mine's precipitation plant (shut down without production in 1983); the Inspiration smelter and acid plant; and the Christmas underground, open pit mine and concentrator, shut down without production in 1983.

"The amount of concentrates available dictated a sporadic operating schedule for Inspiration Copper Smelter in 1983, which contributed to the poorer results. The Pinto Valley mine that had been the main supplier of smelter toll material remained shut during the entire year. The smelter operated successfully on domestic concentrates, some outside concentrates and a large volume of secondary materials that had accumulated during past years." 1/

"In 1983, Inspiration Copper signed a five-year agreement with Duval Corporation for the purchase of concentrates, deliveries of which began in early 1984." 1/

"At the end of May, 1983, Inspiration Copper reached agreement on new three-year labor contracts with all the unions representing its employees. This marked the first time in 20 years that new agreements were reached without a strike. The new pacts include a freeze on wage rates and pension benefits." 1/

KENNECOTT

In 1981, the Kennecott Corporation became a wholly owned subsidiary of the Standard Oil Company of Ohio (Sohio). Sohio, in turn, is 53% owned by a subsidiary of the British Petroleum Company.

The Ray Mines Division (Arizona) of Kennecott includes an open pit mine (at Ray), a sulfide concentrator, a solvent extraction-electrowinning plant, a dump leaching operation and precipitation plant, a pyrometallurgical smelter (at Hayden) and a sulfuric acid plant. Ray Mines Division was shut down from May 1982 until September 1983. Since September 1983, the mine and concentrator have been operating at full capacity, but the smelter and the electrowin cathode refinery remained closed at the end of calendar 1983. On July 1, 1983, Kennecott and the 13 international unions representing approximately 5,100 employees at Kennecott's copper operations signed new three-year labor agreements.

Kennecott is the nation's largest copper producer and has three open pit mining and processing operations with total capacity to produce about 440,000 tons of refined copper a year. The Bingham Canyon Mine southwest of Salt Lake City, Utah is the largest copper producer in the United States. Chino Mines, a two-thirds Kennecott, one third Mitsubishi parthership near Silver City, New Mexico, and Ray mines in Arizona each have about half the capacity of Bingham. In addition to copper, Kennecott produces by-product metals including gold, silver, and molybdenum. 2/

1/ Inspiration Resources Corporation, 1983 Annual Report, p. 9.
2/ Source: The Standard Oil Company (Ohio) Annual Report 1983 and Form 10-K.

MAGMA COPPER COMPANY

Magma is a wholly owned subsidiary of Newmont Mining Corporation. Magma operates two underground mines, San Manuel (40 miles northeast of Tucson) and Superior (65 miles east of Phoenix) with a concentrator at each. Also located at San Manuel are a smelter, a sulfuric acid plant, an electrolytic refinery and a continuous rod casting plant. The Superior mine was shut down in August 1982 and remained on care and maintenance status in 1983.

"The San Manuel mine operated at 83 percent of capacity, slightly lower than the rate in 1982. It produced 18.3 million tons of ore at an average grade of 0.64 percent copper during the year, compared with 18.2 million tons at an average grade of 0.66 percent in 1982." 1/

"Mine development at the San Manuel mine was limited to the level required to support continuing production at the 80 percent capacity operating range." 1/

"A major research project was started in 1983 to determine the feasibility of recovering copper from thelarge quantity of copper oxide ores that overlay the sulphide ore body at the San Manuel mine." 1/

"At mid-year, Magma signed three-year labor agreements with the labor unions representing its workers. The agreements reduced some fringe benefit costs and provided for wage increases to be limited solely to cost-of-living adjustments." 1/

NORANDA LAKESHORE MINES, INC.

Noranda Lakeshore Mines, Inc. is a wholly owned subsidiary of Noranda Mines Ltd. of Canada. The mine is located 28 miles southwest of Casa Grande, Pinal County, on the Papago Indian Reservation.

All underground development was suspended in April 1982, but a successful test program resulted in the development and construction of a full scale in-situ leach facility designed to extract copper from the broken low grade oxide ore remaining from the mined out block cave operation.

Underground mining and vat leaching at Lakeshore was terminated in late 1983 and replaced by in-situ leaching. Pregnant solutions are pumped from collection sumps and dams to the surface for distribution to the solvent extraction-electrowinning plant.

PHELPS DODGE CORPORATION

Phelps Dodge has five operating copper units in Arizona: 1. The Morenci Branch is comprised of the Morenci open pit mine which now includes the Metcalf open pit mine, two concentrators, a dump leaching and precipitation

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1/ Newmont Mining Corporation Annual Report, 1983 p. 11

plant, the Morenci smelter and acid plant. 2. The New Cornelia Branch at Ajo includes an open pit mine, a concentrator, a smelter and acid plant. 3. The Copper Queen at Bisbee consists of leaching activities at the Lavender pit, underground mines and dumps and a precipitation plant. 4. The Douglas Reduction Works (Douglas, AZ) operates a smelter with a rated capacity of 700,000 tons per year of input material. 5. The Safford Branch is a low-grade sulfide copper deposit near Safford, AZ. Active underground development work was suspended in April 1982 and has, since then, been maintained in standby condition.

The Corporation also owns a low-grade sulphide copper deposit in Copper Basin, southwest of Prescott, Arizona. This deposit is estimated to contain 175 million tons of copper-bearing material averaging 0.55% copper and 0.021% molybdenum. No significant progress was made during 1983 in advancing the Corporation's applications to exchange land it owns in northern Arizona for land owned by the Federal government that will be needed eventually to bring this property into production. Until the land exchanges are accomplished no decision can be made concerning when to bring the property into production." 1/

The Morenci and Ajo concentrators incorporate molybdenum flotation sections which permit molybdenum disulfide to be extracted from the copper concentrates when it is economic to do so.

"The concentrates and precipitates produced from the Corporation's properties, together with concentrates smelted on toll for other companies and minor amounts of purchased ores and concentrates, are smelted at the Corporation's smelters at Morenci, Ajo and Douglas, Arizona and at its Hidalgo smelter at Playas, New Mexico. Production at the three Arizona smelters was suspended in April 1982 coincident with the closing of the mines and concentrators. Operations (mining) resumed as follows: Morenci - October 1982; Ajo - February 1983; and Tyrone - May 1983. Mining at Metcalf, which had been suspended at the end of 1980, resumed with the Morenci start-up in 1982 in order to exploit a substantial tonnage of ore that could be mined with a lower waste stripping ratio than usual. The Morenci and Metcalf pits are managed as an intergrated mining unit." 1/

"The Douglas smelter resumed operation on a reduced basis in mid-July 1982, was shut down again in November 1982, and was restarted in April 1983. The Morenci smelter was restarted at a reduced production rate in mid-October 1982 in conjunction with the reopening of the Morenci mine and concentrators. Concentrates produced by the Morenci concentrators in excess of the amounts that could be treated at the Morenci smelter were smelted at the Hidalgo and Douglas smelters or sold. Concentrate produced at Ajo has been smelted principally at Douglas while operations at the Ajo smelter have been suspended." 1/

Labor union contracts with Phelps Dodge which expired in 1983 were not successfully renegotiated and a general worker's strike occurred at all Arizona branches on July 1, 1983. The strike was not settled by the end of calendar 1983, but production continued with non-union labor.

1/ Phelps Dodge Annual Report on Form 10-K, 1983, pp. 3-5.

PINTO VALLEY COPPER CORPORATION

Pinto Valley Copper Corporation is a wholly owned subsidiary of Newmont Mining Corporation. It was established in March 1983, to acquire the mines, mill and electrowinning facilities of the Miami Division of Cities Service Company. Unfavorable market conditions and low copper prices in 1983 caused Pinto Valley Copper to limit production to its low-cost leaching and solvent extraction-electrowinning operations. All mining and milling operations remained shut down and development of the Miami East underground ore body was suspended. The precipitation plant at the Copper Cities operations was shut down in June 1982 and is no longer considered a production unit.

In July, 1983, Pinto Valley entered a new three-year labor agreement following the previously established industry pattern.

"Existing Pinto Valley contracts for smelting and refining of concentrates were to expire in September, 1984. Agreement was reached in January 1984, to cancel these contracts on advantageous terms." 1/ Future Pinto Valley production will be treated at the Magma smelter and refinery.

RANCHERS EXPLORATION AND DEVELOPMENT CORPORATION

The Bluebird mine, located a few miles west of Miami, Gila County, Arizona, is owned and operated by Ranchers Exploration and Development Corporation. This open pit copper mine suspended active excavation in July 1981, but some copper was recovered in 1982 by the sulfuric acid leaching of pre-existing oxide ore heaps and running the pregnant solutions through a solvent extraction-electrowinning plant.

"Production from the mine was discontinued on October 25, 1982, due to the unavailability of low-cost acid for leaching and the depletion of the leach heaps. During the period from July 1, 1982 to October 25, 1982 approximately 3.1 million pounds of copper were produced." 2/ Operations remained closed during the remainder of 1982 and all of 1983.

Note: In late July 1984, a merger of Ranchers Exploration and Development Corporation into Hecla Mining Company was completed. The merger made Hecla the largest domestic silver producer.

1/ Newmont Mining Corporation Annual Report, 1983, pp. 11-12
2/ Ranchers Exploration and Development Corporation Annual Report on 10-K 1983, p. 17.

CONTACT INFORMATION FOR MAJOR COPPER PRODUCERS
OPERATING IN ARIZONA

Anamax Mining Company

Twin Buttes Mine, Box 127, Sahuarita, AZ 85629. Phone (602) 791-2810.

ASARCO Incorporated, 120 Broadway, New York, NY 10271. Phone (212) 669-1000

Tucson Office, 1150 N. 7th Avenue, P.O. Box 5747, Tucson, AZ 85703. Phone (602) 792-3010.

Hayden Unit, P.O. Box 98, Hayden, AZ 85235. Phone (602) 356-7804.

Mission Unit, P.O. Box 111, Sahuarita, AZ 85629, West Pima Mine Road. Phone (602) 791-2920.

San Xavier Unit. Same as Mission Unit.

Sacaton Unit, P.O. Box V, Casa Grande, AZ 85222. Phone (602) 836-2171. Located 3 miles northwest of Casa Grande on Maricopa Road.

Silver Bell Unit, Silver Bell, AZ 85270. Phone (602) 622-6751.

Cyprus Mines Corporation, 7000 S. Yosemite St., Englewood, CO 80112. Phone (303) 740-5000.

Cyprus Bagdad Copper Company, P.O. Box 245, Bagdad, AZ 86321. Phone (602) 633-2241.

Cyprus Johnson Copper Company, P.O. Drawer R, Benson, AZ 85602. Phone (602) 586-2241. Located 1½ miles north of Highway I-10 via Exit 322.

Cyprus Pima Mining Company, P.O. Box 7187, Tucson, AZ 85725. Phone (602) 791-2870.

Duval Corporation, 4715 E. Fort Lowell Road, Tucson, AZ 85712. Phone (602) 323-5600.

Mineral Park Division, P.O. Box 3009, Kingman, AZ 86401. Phone (602) 565-2226. Located 7 miles north of Kingman.

Esperanza and Sierrita Properties, P.O. Box 125, Sahuarita, AZ 85629. Phone (602) 791-2950. Located 32 miles south of Tucson.

Inspiration Consolidated Copper Company/Inspiration Mine Inc.

Inspiration, P.O. Box 4444, Claypool, AZ 85532. Phone (602) 473-7000.

Kennecott, Ten Stamford Forum, Stamford, CT 06904. Phone (203) 964-3000.

Ray Mines Division, P.O. Box 9, Hayden, AZ 85235. Phone (602) 356-7811.

Ray, AZ (mine), phone (602) 363-5531.

Magma Copper Company, P.O. Box M, San Manuel, AZ 85631. Corporate headquarters. Phone (602) 385-2201.

San Manuel Division (Same as corporate headquarters above).

Superior Division, P.O. Box 37, Superior, AZ 85273. Phone (602) 689-2444.

Noranda Lakeshore Mines, Inc., P.O. Box C-6, Casa Grande, AZ 85222. Phone (602) 836-2141.

Phelps Dodge Corporation, 300 Park Ave., New York, NY 10022. Phone (212) 940-6400.

Western Operations Office, 2600 N. Central Avenue, Phoenix, AZ 85004-3015. Phone (602) 234-8100.

Douglas Reduction Works, P.O. Drawer E, Douglas, AZ 85607. Phone (602) 365-2441.

Copper Queen Branch, Highway 92, Bisbee, AZ 85603. Phone (602) 432-3621.

Morenci Branch, Morenci, AZ 85540. Phone (602) 865-4521.

New Cornelia Branch, Ajo, AZ 85321. Phone (602) 387-7451.

Safford Branch and Small Mines and Mine Development, Box 151, Safford, AZ 85546. Phone (602) 428-6900.

Pinto Valley Copper Corporation, Box 100, Miami, AZ 85539. Phone (602) 425-7611.

Ranchers Exploration and Development Corporation. Merged into Hecla Mining Company, July, 1984, Hecla Bldg., Wallace, Idaho 83873. Phone (208) 752-1251.

Parent Companies

ASARCO Incorporated, 120 Broadway, New York, NY 10271.
(Anamax Minerals Company, 50%)

Atlantic Richfield Company, 515 South Flower St., Los Angeles, California 90071. Phone (213) 486-3511.
(Anaconda Minerals Company, 100%-Anamax Minerals Company, 50%)

Hecla Mining Company, Hecla Bldg., Wallace, Idaho 83873. Phone (208) 752-1251.
(Ranchers Exploration and Development Corporation merged into Hecla Mining Co., July, 1984)

Inspiration Resources Corporation, 250 Park Ave., New York, NY 10177. Phone (212) 503-3100.
(Inspiration Consolidated Copper Company/Inspiration Mines Inc., 100%)

Newmont Mining Corporation, 300 Park Ave., New York, NY 10022. Phone (212) 980-1111.
(Magma Copper Company and Pinto Valley Copper Corporation, 100%)

Noranda Mines Ltd., P.O. Box 45, Commerce Court West, Toronto M5L 1B6, Ontario, Canada. Phone (416) 867-7111.
(Noranda Lakeshore Mines, Inc., 100%)

Pennzoil Company, P.O. Box 2967, Houston, Texas 77252-8200. Phone (713) 564-4000.
(Duval Corporation, 100%)

Standard Oil Company (Indiana), 200 East Randolph Drive, Chicago, Illinois 60601.
(Cyprus Mines Corporation, 100%)

Standard Oil Company (Ohio), Midland Building, Cleveland, Ohio 44115. Phone (216) 575-4141.
(Kennecott, 100%)

SEVERANCE TAX ON METALLIFEROUS MINERALS

Background

Laws of 1982, Chapter 230 repealed the tax on sales of metalliferous minerals and enacted a severance tax in its place. Under the provisions of the severance tax, metalliferous minerals were to be taxed at the time of production, not at the time of sale. All metalliferous minerals produced after 1982 were to be taxed on the greater of the following two values:

1. The "weighted mineral value" which is essentially the cost of extracting the minerals from the earth and delivering them to the site where they will be processed, or

2. A specified percentage of the old sales tax base.

The severance tax was to be levied on metalliferous minerals at a rate of 2½ percent. Unless otherwise provided by law, the tax was to be administered in the same manner as the sales tax. As a result, severance tax payments were due on the first day of the second month following the month in which the tax accrued. From January 1, 1983 through June 30, 1983, 40 percent of the severance tax was to be distributed in the same manner as the transaction privilege tax (i.e. 25 percent to the cities, 33.6 percent to the counties and 41.4 percent to the state). In subsequent fiscal years, a progressively larger share of the severance tax was to be distributed in the same manner as the transaction privilege tax. The balance of severance tax collections, after making this distribution, was to be deposited each year in the state's general fund. (Effective from and after December 31, 1982.)

Laws of 1983, Chapter 4 changed the due date for payment of the Severance Tax to the twentieth day of the month following the month in which the tax accrues. Taxes were to be delinquent if not received by the Department of Revenue on the day preceding the last day of the month in which they were due. (Effective April 1, 1983.) The law also changed the interest rate on delinquent tax payments to equal the rate established by Section 6621 of the Internal Revenue Code, compounded annually. (Effective February 11, 1983.)

Legal Citation

A.R.S. 42-1461 - 42-1466.

Paid by

Persons engaged in the business of extracting substances from the earth that become metalliferous minerals (A.R.S. 42-1461 - 42-1462.)

Exemptions

None.

Severance Tax on Metalliferous Minerals
continued

Tax Base

The severance tax is levied on the "net severance base" of all metalliferous minerals produced after 1982. (42-1462) The "net severance base" is the greater of the following two values (42-1464, Laws of 1982, Chapter 230, Section 12):

1. The "weighted mineral value", or

2. A specified percentage of the old sales tax base (the gross value of production less out-of-state processing costs). This value will be referred to as the "Arizona value" after June 30, 1985.

The "weighted mineral value" is essentially the cost of extracting the minerals from the earth and delivering them to the site where they will be processed.
The "weighted mineral value" is determined using the following formula (42-1464):

$$\text{weighted mineral value} = \frac{\text{mining costs}}{\text{total production costs}} \times \text{gross value of production}$$

where:

mining costs represent the cost of extracting the minerals from the earth and delivering them to the site where they will be processed further (42-1461).

total production costs include most of the major costs incurred in mining and processing minerals until the point of sale (42-1461).

gross value of production is determined by multiplying the recoverable units of a metallic product by the per unit price of the product; the price per unit does not include the cost of manufacturing, fabricating or otherwise transforming a refined mineral product, when these activities occur prior to sale of the product (42-1461).

Although metalliferous minerals will no longer be taxed on the old sales tax base, the value of minerals produced after 1982 may not fall below a specified percentage of the old tax value. (42-1464, Laws of 1982, Chapter 230, Section 12). The old tax value included not only the cost of extracting the minerals from the earth, but most of the major in-state costs of producing the minerals. This value was determined by multiplying the recoverable units of a metallic product by the per unit price and deducting the out-of-state processing costs from the result. (42-1464; Laws of 1982, Chapter 230, Section 12; 41-1461). The following table shows the minimum percentage of the old tax value that may be assigned to minerals for severance tax purposes. (42-1464; Laws of 1982, Chapter 230, Section 12):

Severance Tax on Metalliferous Minerals
continued

Period during which minerals are produced	Minimum value of minerals for purposes of determining the severance tax
January 1, 1983 - June 30, 1983	100% of the old taxable sale value
July 1, 1983 - June 30, 1984	83-1/3% of the old taxable sale value
July 1, 1984 - June 30, 1985	66-2/3% of the old taxable sale value
July 1, 1985 and thereafter	50% of the old taxable sale value

Tax Rate

During fiscal years 1980-81, 1981-82 and 1982-83, businesses that produced mineral products were permitted to claim a tax credit against the Special Excise Tax for Education. The tax credit was determined by formula (see "TAX CREDIT" under "SPECIAL EXCISE TAX FOR EDUCATION"). The tax credit could not exceed the taxpayer's Special Excise Tax liability for the year. However, if a taxpayer had an unused amount of credit for any year in which his production was curtailed due to economic conditions, the unused credit could be carried forward for a period not to exceed three years. Since the Special Excise Tax does not apply to metalliferous minerals after December 31, 1982, businesses that produce metalliferous minerals are authorized to claim this tax credit against their severance tax liability, beginning in 1983. In 1982-83, the amount of credit claimed may not exceed 40 percent of the taxpayer's severance tax liability. (Laws of 1982, Chapter 228, Section 2; Laws of 1982, Chapter 230, Section 15)

Due Date

Collections from the severance tax on metalliferous minerals are due on the twentieth day of the month following the month in which the tax accrues. Taxes are delinquent if they are not received by the Department of Revenue on the day preceding the last day of the month in which they are due. The due date may be extended by the Department of Revenue for good cause, but not beyond the first day of the third month following the regular due date. (42-1465, 42-1322)

Collecting Agency

Department of Revenue. (42-1462, 42-101)

Dedication or Purpose

To aid in defraying the necessary and ordinary expenses of the state, cities, and counties to reduce or eliminate the annual tax levy on property for state, city and county purposes and to reduce the levy on property for public school education. (Laws of 1982, Chapter 230, Section 17)

Yield

No monies will be collected from this tax until fiscal year 1982-83.

Severance Tax on Metalliferous Minerals
continued

Distribution

Each year, a portion of severance tax collections will be distributed in the same manner as the transaction privilege tax (i.e. 25 percent to the cities, 33.6 percent to the counties and 41.4 percent to the state). The portion of collections that is distributed in this manner will increase each fiscal year until 1986-87. The table below shows the amount of severance tax collections that will be distributed in the same manner as transaction privilege taxes during each fiscal year. (42-1465, Laws of 1982, Chapter 230, Section 16)

period during which collections are received	portion of severance tax collections distributed in the same manner as the transaction privilege tax
January 1, 1983 - June 30, 1983	40%
July 1, 1983 - June 30, 1984	48%
July 1, 1984 - June 30, 1985	60%
July 1, 1985 and thereafter	80%

After making this distribution the balance of severance tax collections will be deposited each year in the state's general fund and is appropriated for public educational purposes. (42-1465; Laws of 1982, Chapter 230, Section 16)

Source: State of Arizona Tax Handbook - 1983
Prepared by the Staff of the Joint Legislative Budget Committee

INVENTORY TAX ON METALLIFEROUS MINERALS

Background

Laws of 1982, Chapter 230, Section 13, established an inventory tax on metalliferous minerals. The tax was to be imposed on each producer's 1982 year end inventory of mined metallic products. In determining the tax, producers were allowed to deduct the value of any inventory which had previously been taxed or was exempt from taxation under the sales tax laws of this state. The inventory tax was to be levied at a rate of 1-1/2 percent and was payable in twelve equal monthly installments. The first installment was to be paid to the Department of Revenue on or before March 6, 1983. Taxpayers who were not mining in January of 1983 could be granted a one month extension for each month after December that the mine did not produce. The due date for the first monthly installment could not, however, be extended for more than six months. Under the provisions of this law, 40 percent of collections from the inventory tax was to be distributed in the same manner as the transaction privilege tax. The remaining collections were deposited directly into the general fund. (Effective from and after December 31, 1982.)

Legal Citation

See Session Laws of 1982, Chapter 230, Section 13.

Paid By

Persons engaged in the business of extracting substances from the earth that become metalliferous minerals (Laws of 1982, Chapter 230, Section 13, 42-1461)

Exemptions

None

Tax Base

The Inventory Tax is levied on the "net severance base" of the 1982 year end inventory of all metalliferous minerals in this state. The net severance base is determined as follows:

1. Calculate the gross value of production for all metallic products in the 1982 year end inventory. The gross value of production is determined by multiplying the recoverable units of a metallic product by the per unit price of the product; the price per unit does not include the cost of manufacturing, fabricating or otherwise transforming a refined mineral product, when these activities occur prior to sale of the product.

2. Subtract the out-of-state processing costs from the gross value of production for all metallic products in the 1982 year end inventory. Out-of-state processing costs means processing costs incurred by the taxpayer out of this state, including freight charges for shipping metallic products out of state.

Inventory Tax on Metalliferous Minerals
Continued

3. From the difference determined in step #2, deduct the value of metallic products that were previously taxed or were exempt from taxation under the sales tax laws of this state.

(Laws of 1982, Chapter 230, Section 13; 42-1461)

Tax Rate

Two and one-half percent of the net severance base. (Laws of 1982, Chapter 230, Section 13)

Tax Credit

During fiscal years 1980-81, 1981-82 and 1982-83, businesses that produced mineral products were permitted to claim a tax credit against the Special Excise Tax for Education. The tax credit was determined by formula (see "TAX CREDIT" under "SPECIAL EXCISE TAX FOR EDUCATION"). Since the Special Excise Tax does not apply to metalliferous minerals after December 31, 1982, businesses that produce metalliferous minerals are authorized to claim this tax credit against their inventory tax liability, for the remainder of the 1982-83 fiscal year. The amount claimed may not exceed 40 percent of the taxpayer's inventory tax liability. (Laws of 1982, Chapter 230, Section 15)

Due Date

Collections from the inventory tax on metalliferous minerals are payable in twelve equal monthly installments, with the first installment due on or before March 6, 1983. If a taxpayer was not mining in the month of January 1983, the Department is required to grant a one month extension of the date when the first monthly installment is due. For each subsequent consecutive month that a taxpayer does not mine, the Department is required to grant an additional one month extension. In no event shall the due date for the first monthly installment be extended for more than six months. (Laws of 1982, Chapter 230, Section 13)

Collecting Agency

Department of Revenue. (Laws of 1982, Chapter 230, Section 13)

Dedication or Purpose

To aid in defraying the necessary and ordinary expenses of the state, cities and counties, to reduce or eliminate the annual tax levy on property for state, city and county purposes and to reduce the levy on property for public school education. (Laws of 1982, Chapter 230, Section 17)

Yield

No monies will be collected from this tax until fiscal year 1982-83.

-continued-

Inventory Tax on Metalliferous Minerals
continued

Distribution

Of the total amount collected from the inventory tax on metalliferous minerals, 40 percent is to be distributed in the same manner as the transaction privilege tax and the balance is to be deposited in the state general fund. (Laws of 1982, Chapter 230, Section 16)

Source: State of Arizona Tax Handbook - 1983
Prepared by the Staff of the Joint Legislative Budget Committee

TABLE I

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1983

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
ANAMAX MINING COMPANY					
Eisenhower (Anamax share)1/	N/A	3,126,489	34,902,176 2/	328,077	N/A
Twin Buttes 3/	728,598	4,384,607	63,313,377	266,927	830,461
Precipitate Cu			(50,648,792)4/		
Total	728,598	7,511,896	98,215,553	595,004	830,461
ASARCO, INC.					
Eisenhower (ASARCO share)	3,035,900	3,035,900	44,633,743	-0-	1,733,900
Mission	3,992,600	3,992,600	47,692,935	-0-	10,066,200
Sacaton	4,003,449	4,003,449	37,587,333	-0-	1,409,800
San Xavier	2,784,300	2,784,300	22,566,716	-0-	2,663,300
Silver Bell 1/	864,500	864,500	18,021,108	-0-	939,980
Precipitate Cu			(10,373,785) 2/		
Total	14,680,749	14,680,749	170,501,835	-0-	16,813,180

1/ Mine down 7/31/83 - Labor dispute

2/ Pounds copper in concentrate

3/ Twin Buttes shut down January 28,1983

4/ Included in pounds recoverable copper

1/ Mine and concentrator were shut down from Jan. thru Sept. 1983

2/ Included in pounds recoverable copper

TABLE I
(Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1983

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
CYPRUS MINES CORPORATION					
Bagdad	19,901,000	19,612,000	162,065,000	2,926,000	30,350,000
Precipitate Cu			(13,282,000) 1/		
Johnson	1,962,000	-0-	9,717,606	-0-	67,700
Pima 2/	-0-	-0-	-0-	-0-	-0-
Total	21,863,600	19,612,000	171,782,606	2,926,000	30,417,700
DUVAL CORPORATION					
Esperanza 1/	-0-	-0-	-0-	-0-	-0-
Precipitate Cu			6,366,791		
Mineral Park 2/	-0-	-0-	-0-	-0-	-0-
Precipitate Cu	-0-	-0-	3,100,700		
Sierrita	20,727,891	21,240,907	130,401,953 3/	12,634,791	6,767,195
Total	20,727,891	21,240,907	139,869,444	12,634,791	6,767,195

1/ Included in pounds recoverable copper

2/ Cyprus Pima was shut-down during all of 1983

1/ Mine shut-down all of 1983

2/ Mine shut-down all of 1983

3/ Pounds copper in concentrates

TABLE I
(Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1983

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
INSPIRATION CONSOLIDATED COPPER CO.					
Christmas 1/	-0-	-0-	-0-	-0-	-0-
Inspiration	30,176,000	7,089,000	162,244,000	286,000	8,265,000
Precipitate Cu			(78,988,000) 3/		
Ox Hide 2/					
Total	30,176,000	7,089,000	162,244,000	286,000	8,265,000

1/ Shut-down without production in 1983

2/ Shut-down without production in 1983

3/ Included in pounds recoverable copper

KENNECOTT CORPORATION					
Ray Mines Division 1/	2,963,810	2,963,810	-0-	-0- 3/	8,065,610
Precipitate Cu			20,032,825		
Concentrate			54,162,687 2/		
Total	2,963,810	2,963,810	74,195,512	-0-	8,065,610

1/ Mine was shut-down January-August 1983

2/ Solvent extraction/electrowinning plant was shut-down in 1983

3/ Molybdenum plant shut-down 1983

TABLE I
(Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1983

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
MAGMA COPPER COMPANY					
San Manuel	18,272,239	18,207,167	199,409,000	3,478,259	N/A
Superior 1/	-0-	-0-	-0-	-0-	-0-
Total	18,272,239	18,207,167	199,409,000	3,478,259	-0-
NORANDA LAKESHORE MINES, INC.					
Lakeshore	1,064,436	1,292,775	37,519,504	-0-	N/A
Precipitate Cu			(3,243,975)1/		
Total	1,064,436	1,292,775	37,519,504	-0-	-0-

1/ Temporarily shut-down

1/ Included in pounds recoverable copper

TABLE 1
(Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1983

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
PHELPS DODGE CORPORATION					
Copper Queen Branch Precipitate Cu			5,200,000		
Morenci and Metcalf	34,401,827	34,401,827	356,368,000	523,723	21,988,000
Precipitate Cu			(69,158,000) 1/		
New Cornelia Branch 2/	8,023,000	8,023,000	74,600,000	159,584	2,371,047
Precipitate Cu					
Total	42,424,827	42,424,827	436,168,000	683,307	24,359,047

1/ Included in pounds recoverable copper

2/ Shut-down without production January and February 1983

TABLE I
(Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1983

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
PINTO VALLEY COPPER CORPORATION 1/					
Copper Cities 2/					
Miami (Cities Service)			1,645,295		
Miami (Pinto Valley Copper Corp.)			7,643,968		
Sub-total 3/			9,289,263		
Pinto Valley (Cities Service)			2,458,996		
Pinto Valley (Pinto Valley Copper Corp.)			12,884,249		
Sub-total 4/			15,343,245		
Total			24,632,508		

1/ Prior to March 1, 1983 was the Metals Division of Cities Service Co.

2/ Precipitation plant was shut-down in June 1982 and is no longer considered a production unit

3/ Miami SX-EW plant operated continuously with feed from old Miami Copper caved area

4/ Pinto Valley SX-EW plant operated continuously with feed from mine leach dumps

TABLE I
(Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1983

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
RANCHERS EXPLORATION AND DEVELOPMENT CORPORATION					
Bluebird 1/					
Total					
TOTAL LARGE COMPANIES	152,902,150	135,023,131	1,514,537,962	20,603,361	95,518,193

1/ Mine closed and placed on standby Oct. 25, 1982

Source: Personal correspondence with individual companies.

TABLE II
ARIZONA LEACH COPPER PRODUCTION 1/

(Thousand Pounds)

MINE OPERATION	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
ANAMAX MINING COMPANY										
Twin Buttes	--	13,462	57,925	68,772	71,614	70,343	63,719	67,922	60,796	50,649
ASARCO INCORPORATED										
San Xavier 2/	11,762	19,384	22,772	12,860	15,183	--	--	--	--	--
Silver Bell	7,860	8,497	8,627	5,012	6,267	6,980	4,423	7,950	8,687	10,374
BIG HOLE MINING CO.										
United Verde	44	32	--	--	--	--	--	--	--	--
CYPRUS MINES CORP.										
Bagdad	13,508	14,321	14,606	15,011	14,097	14,337	12,668	13,244	13,173	13,282
Johnson	--	6,143	10,060	10,327	10,205	10,032	10,302	10,693	9,702	--
DUVAL CORPORATION										
Esperanza	1,817	3,960	6,412	8,636	7,469	6,002	9,991	11,566	9,354	6,367
Mineral Park	6,801	6,915	6,817	5,260	4,813	3,348	3,690	4,194	3,191	3,101
EL PASO NATURAL GAS										
Emerald Isle	--	--	--	--	--	--	--	--	--	--
INSPIRATION CONSOLIDATED COPPER COMPANY										
Inspiration	47,765	52,470	45,545	20,883	35,945	16,638	28,958	50,532	(Est.) 50,000	78,988
Ox Hide	9,679	10,107	7,915	4,639	4,147	1,178	1,015	761	1,572	--
KENNECOTT CORPORATION										
Ray 3/	25,478	24,338	24,374	24,334	25,013	26,502	25,875	25,788	22,420	20,033
MCALESTER FUEL COMPANY										
Zonia	2,717	619	--	--	--	--	--	--	--	--

(Continued)

TABLE II
ARIZONA LEACH COPPER PRODUCTION 1/

(Thousand Pounds)

MINE OPERATION	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
NORANDA LAKESHORE MINES INC.										
Lakeshore	--	--	28,407	25,031	--	--	--	26,071	45,611	3,244
PHELPS DODGE CORPORATION										
Copper Queen Branch 4/	6,402	8,377	7,893	8,526	7,932	7,316	6,052	4,600	4,545	5,200
Morenci Branch	22,704	23,778	53,136	41,545	51,362	93,983	86,840	96,090	75,735	69,158
New Cornelia Branch	--	--	--	--	--	--	--	--	661	--
PINTO VALLEY COPPER CORP.										
Copper Cities	3,295	3,562	3,370	3,346	3,806	4,351	3,984	3,622	2,046	--
Miami	11,969	13,076	13,509	11,732	11,703	12,636	11,184	10,217	10,301	9,289
Pinto Valley	--	--	--	--	--	--	--	5,519	16,657	15,343
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION										
Bluebird	15,344	15,122	17,876	17,069	3,926	10,955	13,017	13,328	NR	--
Old Reliable	2,175	467	--	--	--	1,005	1,128	149	--	--
TOTALS	189,320	224,630	329,244	282,983	283,482	285,606	282,846	352,246	334,451	285,028
PERCENT OF PRIMARY COPPER PRODUCED 5/, 6/	11.0	13.8	16.1	15.3	13.9	13.3	16.4	15.0	19.6	18.8

Source: Arizona Department of Mines and Mineral Resources; This report, Table I-II.

1/ Copper recovered from precipitate and/or by solvent extraction from material dump, heap, vat or in-situ leached.
2/ San Savier discontinued production of siliceous flux and commenced production of copper precipitate as of 5/1/73.
3/ Includes only copper contained in precipitates from dump leaching. Does not include copper production by electro-winning.
4/ Lavender Pit and Copper Queen Mine.
5/ Leach copper compared to total copper produced from all primary sources as reported in "Minerals Yearbook - Area Reports: Domestic", U.S. Bureau of Mines for 1973-1978.
6/ Leach Copper compared to total copper produced as reported in Table I for 1979-1983.

TABLE III

RANK OF ARIZONA'S COPPER COMPANIES

BY PRODUCTION OF COPPER AND MOLYBDENUM

1983

Copper 1/			Molybdenum		
Rank	Company	% of AZ Production	Rank	Company	% of AZ Production
1	Phelps Dodge Corp.	28.80	1	Duval Corp.	61.32
2	Magma Copper Company	13.17	2	Magma Copper Company	16.88
3	Cyprus Mines Corp.	11.34	3	Cyprus Mines Corp.	14.20
4	ASARCO Inc.	11.26	4	Phelps Dodge Corp.	3.32
5	Inspiration Cons. Copper Co.	10.71	5	Anamax Mining Co.	2.89
6	Duval Corp	9.24	6	Inspiration Cons. Copper Co.	1.39
7	Anamax Mining Company	6.48			
8	Kennecott Corp.	4.90			
9	Noranda Lakeshore Mines Inc.	2.48			
10	Pinto Valley Copper Corp.	1.63			
		100.00			100.00

Source: Arizona Department of Mineral Resources: This Report, Table I

1/ Precipitate and/or cathode copper included in production total where applicable.

TABLE IV
RANK OF ARIZONA'S COPPER MINES
BY PRODUCTION OF COPPER AND MOLYBDENUM 1983

RANK	COPPER 1/ Mine/Company Copper Produced, lb.	% of Ariz. Production	MOLYBDENUM Mine/Company Moly.Produced, lb.	% of Ariz. Production
1	Morenci-Metcalf/Phelps Dodge 356,368,000	23.53%	Sierrita/Duval 12,634,791	61.32%
2	San Manuel/Magma 199,409,000	13.17%	San Manuel/Magma 3,478,259	16.88%
3	Inspiration/Inspiration 162,244,000	10.71%	Bagdad/Cyprus 2,926,000	14.20%
4	Bagdad/Cyprus 162,065,000	10.70%	Morenci-Metcalf/Phelps Dodge 523,723	2.54%
5	Sierrita/Duval 130,401,953	8.61%	Eisenhower/Anamax/ASARCO 328,077	1.59%
6	Eisehnower/Anamax/ASARCO 79,535,919	5.25%	Inspiration/Inspiration 286,000	1.39%
7	New Cornelia (Ajo)/Phelps Dodge 74,600,000	4.93%	Twin Buttes/Anamax 266,927	1.30%
8	Ray/Kennecott 74,195,512	4.90%	New Cornelia (Ajo)/Phelps Dodge 159,584	0.77%
9	Twin Buttes/Anamax 63,313,377	4.18%		
10	Mission/ASARCO 47,692,935	3.15%		
TOTAL	1,349,825,696	89.13%	20,603,361	100.00%

Source: Arizona Department of Mines & Mineral Resources; This Report, Table I
1/ Precipitate and/or cathode copper included in production total where applicable.

TABLE V
ARIZONA MINE PRODUCTION
OF RECOVERABLE COPPER IN SHORT TONS

	1979		1980		1981		1982		1983	
	Amount	% Change	Amount	% Change	Amount	% Change	Amount	% Change	Amount	% Change
BY MONTH										
January	78,030	0.3%	93.374	19.7%	92,769	(0.6)%	84,559	(8.7)%	68,560	(19.0)%
February	77,684	1.3	86,313	11.1	88,061	2.0	82,181	(6.7)	54,455	(30.1)
March	87,879	2.3	96,558	9.9	94,366	(2.3)	90,488	(4.1)	66,475	(26.5)
April	89,757	6.4	93,363	4.0	95,002	1.8	87,385	(8.0)	61,841	(29.2)
May	92,137	2.8	95,749	3.9	97,306	1.6	73,434	(24.5)	63,699	(13.3)
June	84,463	(0.6)	85,210	0.9	93,704	10.0	67,208	(28.3)	65,449	(2.6)
July	82,469	19.7	36,218	(56.1)	95,125	162.6	60,795	(36.1)	54,653	(10.1)
August	92,034	10.2	25,211	(72.6)	101,909	304.2	56,753	(44.3)	52,118	(8.2)
September	86,867	6.7	25,237	(70.9)	98,489	290.3	55,942	(43.2)	64,852	15.9
October	96,233	12.2	49,574	(48.5)	103,774	109.3	61,588	(40.7)	64,049	4.0
November	89,165	3.9	75,745	(15.1)	102,832	35.8	68,010	(33.9)	69,886	2.8
December	86,069	10.7	86,357	(0.3)	83,962	(2.8)	60,307	(28.2)	65,366	8.4
CUMULATIVE YEAR TO DATE										
January	78,030	0.3%	93,374	19.7%	92,769	(0.6)%	84,659	(8.7)%	68,560	(19.0)%
February	155,714	0.8	179,687	15.4	180,830	0.6	166,840	(7.7)	126,015	(24.5)
March	243,593	1.4	276,245	13.4	275,196	(0.4)	257,328	(6.5)	192,490	(25.2)
April	333,350	2.7	369,608	10.9	370,198	0.2	344,713	(6.9)	254,331	(26.2)
May	425,487	2.7	465,357	9.4	467,504	0.5	418,147	(10.6)	318,030	(23.9)
June	509,950	2.1	550,567	8.0	561,208	1.9	485,355	(13.5)	383,479	(21.0)
July	592,419	4.3	586,785	(1.0)	656,333	11.9	546,150	(16.8)	438,132	(19.8)
August	684,453	5.0	611,996	(10.6)	758,242	23.9	602,903	(20.5)	490,250	(18.7)
September	771,320	5.2	637,233	(17.4)	856,731	34.4	658,845	(23.1)	555,102	(15.7)
October	867,553	5.9	686,807	(20.8)	960,505	39.9	720,433	(25.0)	619,151	(14.1)
November	956,718	5.7	762,552	(20.3)	1,063,337	39.4	788,443	(25.9)	689,037	(12.6)
December	1,042,787	6.1	848,909	(18.6)	1,147,299	35.1	848,750	(26.0)	754,403	(11.1)
Average Month	86,899	6.1%	70,742	(18.6)%	95,608	35.2%	70,729	(26.0)%	62,867	(11.1)

NOTE: Percentage change column shows change from corresponding period in prior year. Parentheses indicate a negative change.

Source: U.S. Department of the Interior, Bureau of Mines

Prepared by: JLBC Staff

Date: March 21, 1984

TABLE VI

AVERAGE COPPER CONTENT OF ORE PRODUCED AT ARIZONA COPPER MINES

(Percent Total Copper)

MINE OPERATION		1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
ANAMAX MINING COMPANY 3/												
Twin Buttes	Sulfide	0.82	0.63	0.60	1.12	1.11	1.26	.94	.82	.74	.78	.67
	Oxide	--	--	1.27	1.31	1.30	1.26	1.27	1.26	1.20	1.06	.93
ASARCO INCORPORATED												
Mission	Sulfide	.60	.61	.60	.62	.58	.59	.60	.75	.75	(.75)	(.75)
Sacaton	Sulfide	--	.63	.74	.71	.70	.67	.68	--	--	--	--
San Xavier	Sulfide	--	--	--	--	--	--	.80	.65	.65	(.65)	(.51)
	Oxide 4/	.61	.77	1.05	1.12	--	--	--	--	--	--	--
Silver Bell	Sulfide	.64	.65	.72	.72	.65	.65	--	--	--	--	--
CITIES SERVICE CO./PINTO VALLEY CORP.												
Miami East		--	--	--	--	--	--	--	--	--	--	--
Pinto Valley	Sulfide	--	--	(.45)	(.45)	.49	.52	.49	.49	.46	.46	--
CYPRUS MINES CORPORATION												
Bagdad	Sulfide	.70	.74	.70	.60	.59	.52	.50	.50	.50	.50	.50
Bruce	Sulfide	3.68	3.86	3.73	3.54	3.97	closed	--	--	--	--	--
Johnson	Oxide 1/	--	--	.42	.42	.46	.44	.40	.40	.40	.40	.40
Pima	Sulfide	.51	.50	.48	.47	.48	--	.46	.49	.49	.48	--
DUVAL CORPORATION												
Esperanza	Sulfide	.34	.31	--	.29	.29	--	--	.32	.29	.29	--
Mineral Park	Sulfide	.38	.36	.30	.28	.28	.26	.24	.24	.32	--	--
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Sierrita	Sulfide	.28	.29	.33	.35	.34	.33	.34	.34	.30	.30	(.30)
INSPIRATION CONSOLIDATED COPPER CO.												
Christmas (OP)	Sulfide	.74	.57	.57	.58	.74	--	.74	.73	.62	.62	--
Inspiration Area	Sulfide	.67	.63	.65	.63	.70	.61	.854	.58	.58	.58	.525
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Ox Hide	Oxide 1/	--	--	.29	.27	.27	--	--	--	--	--	--

(Continued)

TABLE VI

AVERAGE COPPER CONTENT OF ORE PRODUCED AT ARIZONA COPPER MINES

(Percent Total Copper)

MINE OPERATION		1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
KENNECOTT CORPORATION	Sulfide	.91	.83	.90	.86	.921	.856	.876	.910	.969	.80	1.187
Ray 5/	Oxide (Silicate)	1.35	1.19	1.231	1.15	--	--	--	--	--	--	--
MAGMA COPPER COMPANY												
San Manuel	Sulfide 2/	--	.70	.64	(.7)	(.7)	.64	.63	.65	.635	.66	0.64
Superior	Sulfide	--	--	(4.5)	(4.5)	(4.5)	4.36	4.41	4.32	4.48	4.32	--
MCALESTER FUEL COMPANY												
Zonia	Oxide	--	--	(.53)	--	--	--	--	--	--	--	--
NORANDA LAKESHORE MINES INC.												
Lakeshore 6/	Sulfide	--	--	--	.75	.91	--	--	--	--	--	--
	Oxide 1/	--	--	--	1.03	.93	--	--	--	1.00	1.00	(1.00)
PHELPS DODGE CORPORATION												
Copper Queen	Sulfide	4.06	3.48	5.70	--	--	--	--	--	--	--	--
Lavender	Sulfide	.60	.47	--	--	--	--	--	--	--	--	--
Metcalf	Sulfide	--	--	.84	.86	.70	.79	.78	.69	--	.78	.73 8/
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Morenci	Sulfide	.82	.82	.79	.80	.81	.80	.72	.82	.74	.72	.73 8/
	Oxide	--	--	--	--	--	--	--	--	--	--	--
New Cornelia	Sulfide	.61	.57	.57	.66	.64	.59	.53	.51	.50	.64	.60
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION												
Bluebird	Oxide	--	--	.48	.58	.79	.70	.40	.40	.40	--	--
WEIGHTED AVERAGE SULFIDE GRADE 7/		.60	.57	.56	.61	.57	.61	.64	.58	.58	.59	.65

Source: Company annual reports, Form 10-K's and Prospectus; "International Directory of Mining and Mineral Processing Operationa", E&MJ; Arizona Department of Mines & Mineral Resources.

( ) Percentage in parenthesis is approximate: not used in calculation of weight average.

(Continued)

TABLE VI

1/ Acid soluble copper.

2/ Sulfide copper.

3/ Included ANAMAX share of Palo Verde deposit for 1979-1982.

4/ Copper bearing silica flux mined 1971-1972.

5/ Grade reported for Kennecott's Ray mine is an average of oxide and sulfide together for 1977 to 1982.

6/ The Lakeshore mine was owned and operated by the Hecla Mining Company in 1976 and 1977.

7/ Weighted average grade of ore milled, based generally on an assay of total copper.

8/ Based on combined Metcalf and Morenci mines production.

TABLE VII

PERCENT CONTAINED COPPER RECOVERED AT ARIZONA COPPER MINES 1/

(Percent of Total Copper)

MINE OPERATION		1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
ANAMAX MINING COMPANY												
Twin Buttes 5/	Sulfide	72	71	63	68	87	76	85	87	85	--	--
	Oxide	--	--	65	75	76	79	78	76	77	--	--
										Total	87	(80 est.)
ASARCO INCORPORATED												
Mission	Sulfide	88	88	88	89	87	87	75	87	94	85	80
Sacaton	Sulfide	--	78	82	82	82	83	78	--	--	--	--
San Xavier	Sulfide	--	--	--	--	--	--	82	66	76	78	79
	Oxide	49	63	67	77	--	--	--	--	--	--	--
Silver Bell	Sulfide	80	78	77	81	78	78	--	--	--	--	--
CITIES SERVICE COMPANY/PINTO VALLEY COPPER CORP.												
Pinto Valley	Sulfide	--	--	--	--	92	89	84	83	94	95	--
CYPRUS MINES CORPORATION												
Bagdad	Sulfide	82	77	81	86	73	83	80	76	94	83	83
Bruce	Sulfide	90	90	93	92	88	closed	--	--	--	--	--
Johnson	Oxide 2/	--	--	43	91	90	96	79	86	86	--	62
Pima	Sulfide	85	85	82	84	79	--	76	84	76	89	--
DUVAL CORPORATION												
Esperanza	Sulfide	87	89	90	91	85	--	--	90	87	--	--
Mineral Park	Sulfide	81	72	81	73	75	76	73	84	75	--	--
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Sierrita	Sulfide	90	89	90	88	88	91	87	86	80	98(?)	(88 est.)
INSPIRATION CONSOLIDATED COPPER CO.												
Christmas (OP)	Sulfide	66	70	73	77	74	--	--	70	71	--	--
Inspiration Area 3/	Sulfide	45	48	46	45	54	55	53	81	74	68	86
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Ox Hide	Oxide 2/	--	--	76	67	56	--	--	--	--	--	--

(Continued)

TABLE VII

PERCENT CONTAINED COPPER RECOVERED AT ARIZONA COPPER MINES

(Percent of Total Copper)

MINE OPERATION		1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
KENNECOTT CORPORATION												
Ray	Sulfide	--	--	--	--	--	--	--	--	7	70	(70 est.)
MAGMA COPPER COMPANY												
San Manuel	Sulfide 4/	--	90	87	--	--	85	83	95	87	89	86
Superior	Sulfide	--	--	--	--	--	90	91	95	93	(93 est.)	--
MCALESTER FUEL COMPANY												
Zonia	Oxide	In-situ Leach 1973-75										
NORANDA LAKESHORE MINES INC.												
Lakeshore	Sulfide	--	--	--	100	99	--	--	--	--	--	--
	Oxide 2/	--	--	--	98	100	--	--	--	92	--	--
PHELPS DODGE CORP.												
Copper Queen	Sulfide	90	90	92	--	--	--	--	--	--	--	--
Lavender	Sulfide	67	52	--	--	--	--	--	--	--	--	--
Metcalf	Sulfide	--	--	63	54	56	61	59	58	--	--	--
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Morenci	Sulfide	71	74	70	70	72	77	68	64	69	68	71 7/
	Oxide	--	--	--	--	--	--	--	--	--	--	--
New Cornelia	Sulfide	85	85	80	80	82	84	80	79	78	85	78
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION												
Bluebird	Oxide	--	--	34	36	38	85	36	41	156 6/	--	--

Source: Company Annual Reports and Form 10-K's, E & MJ International Directory; Arizona Dept. of Mines & Mineral Resources.

1/ Recoveries are based on available reported production and average grade of material treated. A number of oxide operations are not listed because of inadequate data.
2/ Percent recovery of acid soluble copper.
3/ Percent recovery in flotation-concentration treatment, after ore has been leached for 1971-1979.
4/ Percent recovery of sulfide copper.
5/ Recovery includes ANAMAX's share of Palo Verde 1979-1981-1982-1983.
6/ Recovery by leaching heaps continued after mining was terminated in July 1981.
7/ Includes Metcalf production.

TABLE VIII

STRIPPING RATIOS AT ARIZONA OPEN-PIT COPPER MINES 1/

(Waste:Ore)

MINE OPERATION	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
ANAMAX MINING COMPANY											
Twin Buttes	7.60:1	10.80:1	1.60:1 5/	5.50:1	5.60:1	2.00:1	2.90:1	3.32:1	3.62:1	2.05:1	1.14:1
ASARCO INCORPORATED											
Eisenhower 5/	--	--	--	--	--	--	--	--	.71:1	.67:1	0.57:1
Mission	2.50:1	2.30:1	1.50:1	1.50:1	2.30:1	2.30:1	0.76:1	3.05:1	2.01:1	1.62:1	2.52:1
Sacaton	--	--	6.30:1	5.90:1	4.40:1	2.70:1	3.10:1	2.02:1	1.30:1	.70:1	0.35:1
San Xavier	--	--	--	5.10:1	5.00:1	1.10:1	1.10:1	6.01:1	6.18:1	2.90:1	0.96:1
Silver Bell	3.50:1	3.40:1	2.00:1	1.60:1	1.80:1	1.40:1	1.50:1	--	1.41:1	--	1.09:1
CITIES SERVICE CO./PINTO VALLEY COPPER CORP.											
Pinto Valley	--	--	1.80:1	1.70:1	1.70:1	1.60:1	1.80:1	1.07:1	1.77:1	1.80:1	-- 9/
CYPRUS MINES CORPORATION											
Bagdad	5.20:1	4.50:1	1.20:1	9.80:1	7.80:1	1.70:1	1.80:1	1.52:1	1.78:1	1.45:1	1.53:1
Johnson	--	--	0.56:1	1.50:1	1.60:1	2.50:1	1.30:1	2.01:1	1.52:1	-- 8/	0.03:1
Pima	1.60:1	2.80:1	2.00:1	2.00:1	1.60:1	--	5.20:1	6.28:1	3.06:1	1.42:1	-- 9/
DUVAL CORPORATION											
Esperanza	1.50:1	1.50:1	0.71:1	1.10:1	1.10:1	--	1.30:1	0.76:1	1.95:1	--	-- 9/
Mineral Park	0.66:1	0.90:1	0.66:1	2.10:1	1.60:1	1.50:1	1.70:1	1.71:1	1.44:1	--	-- 9/
Sierrita	1.50:1	1.70:1	1.40:1	1.50:1	1.60:1	1.30:1	1.10:1	1.11:1	.98:1	.55:1	0.33:1
INSPIRATION CONSOLIDATED COPPER COMPANY											
Christmas	5.80:1	5.10:1	3.40:1	3.10:1	4.40:1	--	--	4.40:1	3.24:1	--	-- 9/
Inspiration Area	1.90:1	2.20:1	3.10:1	1.90:1	2.40:1	2.80:1	3.40:1	2.40:1	1.53:1	1.42:1	0.27:1
Ox Hide	.028:1	0.32:1	0.38:1	0.38:1	0.20:1	--	--	--	--	--	--
KENNECOTT CORPORATION											
Ray	2.60:1	3.00:1	3.50:1	2.60:1	2.50:1	3.10:1	2.70:1	3.15:1	1.88:1	2.30:1	2.72:1

(Continued)

TABLE VIII

STRIPPING RATIOS AT ARIZONA OPEN-PIT COPPER MINES 1/

(WASTE:ORE)

MINE OPERATION	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
PHELPS DODGE CORPORATION											
Lavender	1.10:1	0.83:1	--	--	--	--	--	--	--	--	--
Metcalf	--	--	2.80:1	1.80:1	1.80:1	1.50:1	2.30:1	1.67:1	--	--	--
Morenci	1.90:1	2.00:1	1.80:1	1.30:1	1.50:1	1.50:1	1.40:1	1.30:1	1.63:1	.79:1	0.64:1 10/
New Cornelia	1.90:1	1.50:1	1.50:1	1.10:1	1.10:1	1.40:1	1.00:1	2.27:1 2/	.48:1 2/	1.21:1	0.30:1
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION											
Bluebird	1.00:1 7/	1.30:1	1.30:1	1.80:1	3.30:1	1.50:1	1.50:1	1.50:1	.003:1 6/	--	--
WEIGHTED AVERAGE*	2.51:1	2.70:1	3.03:1 4/	1.79:1	2.21:1	1.75:1	1.75:1	1.90:1	1.57:1	1.31:1	0.57:1

Source: "Minerals Yearbook - Area Reports: Domestic", U.S. Bureau of Mines; Company Annual Reports: EMJ International Directory of Mining and Mineral Processing Operations; Arizona Department of Mines and Mineral Resources; Company submitted data for 1983.

1/ Leachable rock included with waste (except at solely leach operations).
2/ Includes preproduction stripping.
3/ Stripping continued as sulfide concentrator was shut down from March 1975 to January 1976.
4/ Without Twin Buttes the ratio would be 1.89:1.
5/ Mining is done by ASARCO, includes ANAMAX's share of ore.
6/ Stripping of overburden ceased in January but mining continued until July.
7/ Not used in calculation of weighted average.
8/ No stripping in 1982.
9/ No stripping in 1983.
10/ Combined Morenci and Metcalf.

*NOTE: There are now weighted averages so use caution in making comparisons to the averages presented in previous editions of this report.

TABLE IX

ARIZONA PRODUCTION AND VALUE OF COPPER, MOLYBDENUM, GOLD AND SILVER

RECOVERED FROM COPPER ORE

Year	Copper Ore 1/ Tons	Gold 2/ Troy Ounces Value 5/	Silver 2/ Troy Ounces Value 6/	Molybdenum 3/ 1,000 lbs. Value (in $1,000)	Copper 4/ Pounds Value	Copper 4/ Lbs. Cu/ton ore Ave.¢/lb. 7/	Value of Copper Gold, Silver & Molybdenum
1970	150,240,842	107,292 $3,904,400	7,130,261 $12,626,700	15,672 $26,700	1,694,294,000 $ 977,608,000	11.28 57.700	$1,020,839,100
1971	149,293,547	93,617 $3,820,510	6,106,204 $ 9,437,479	22,684 $39,872	1,529,780,500 $ 786,812,004	9.76 51.433	$ 839,942,263
1972	165,914,825	102,526 $5,987,518	6,614,957 $11,143,226	27,126 $46,791	1,695,858,000 $ 858,392,446	10.22 50.617	$ 922,314,190
1973	181,311,945	102,376 $10,013,397	7,164,988 $18,325,173	37,657 $59,372	1,735,012,000 $1,021,314,814	9.57 58.865	$1,109,025,384
1974	178,913,296	90,206 $14,488,424	6,308,721 $29,701,332	28,346 $57,067	1,609,808,000 $1,233,901,735	9.00 76.649	$1,335,158,491
1975	168,750,152	82,759 $13,364,751	6,190,805 $27,354,196	25,030 $61,411	1,502,978,000 $ 954,917,072	8.91 63.535	$1,057,047,019
1976	194,136,559	97,961 $12,276,473	7,308,395 $31,816,805	31,073 $89,148	1,912,430,000 $1,316,210,823	9.85 68.824	$1,449,452,101
1977	168,641,401	87,874 $13,032,593	6,696,415 $30,957,660	34,574 $120,497	1,705,240,000 $1,122,184,339	10.11 65.808	$1,166,295,089
1978	178,204,491	92,508 $17,905,108	6,611,781 $35,709,502	33,029 $150,142	1,817,670,000 $1,190,755,617	10.20 65.510	$1,244,520,369
1979	203,977,408	99,549 $30,622,766	7,454,306 $82,699,941	35,101 $213,065	1,914,501,095 $1,767,735,441	9.39 92.334	$2,094,081,895

-continued-

TABLE IX

ARIZONA PRODUCTION AND VALUE OF COPPER, MOLYBDENUM, GOLD AND SILVER RECOVERED FROM COPPER ORE

Year	Copper Ore 1/ Tons	Gold 2/ Troy Ounces Value 5/	Silver 2/ Troy Ounces Value 6/	Molybdenum 3/ 1,000 lbs. Value (in $1,000)	Copper 4/ Pounds Value	Copper 4/ LBS. Cu/ton ore Ave. ¢/lb. 7/	Value of Copper Gold, Silver & Molybdenum
1980	169,650,401	71,533 $43,814,606	5,640,703 $116,376,559	36,299 $324,150	1,521,850,812 $1,543,400,219	8.97 101.416	$2,027,741,384
1981	216,787,430	95,496 $43,891,299	7,565,368 $ 79,575,340	35,600 $273,052	2,143,898.000 $1,795,385,941	9.89 83.744	$2,191,904,580
1982	146,124,870	61,050 $22,949,000	6,301,000 $ 50,090,000	22,099 $100,673	1,697,500,000 $1,261,415,000	11.62 74.31	$1,435,127,000
1983	152,902,150	61,991 $26,284,000	4,492,000 $ 51,383,000	23,934 $ 79,459	1,495,208,000 $1,144,285,000	9.78 76.53	$1,301,411,000

Source: "Mineral Yearbook - Area Reports: Domestic", U.S. Bureau of Mines.

1/ Includes some copper-zinc, copper-lead, and/or lead-zinc ore in 1972 and thereafter.

2/ Excludes gold and silver recovered from vat or heap leaching of copper ores and from copper tailings or copper cleanup in 1969 and thereafter.

3/ Molybdenum content of recovered concentrate.

4/ Excludes precipitate copper from dump and in-place leaching prior to 1982.

5/ At average annual domestic, free market gold price in 1970 and thereafter: 1970, $36.39; 1971, $40.81; 1972, $58.40; 1973, $97.81; 1974, $159.73; 1975, $161.49; 1976, $125.32; 1977, $148.31; 1978, $193.55; 1979, $307.615; 1980, $612.509; 1981, $459.614; 1982, $375.905, 1983, $423.997.

6/ At E&MJ average annual N.Y. market price for .999 fine silver.

7/ At E&MJ average annual price, domestic FOB refinery.

TABLE X

ARIZONA MINE PRODUCTION (RECOVERABLE) OF GOLD, SILVER, COPPER AND LEAD IN 1983
BY CLASS OF ORE OR OTHER SOURCE MATERIAL

SOURCE	No. of mines 1/	Material sold or treated (Short tons)	Gold (Troy ounces)	Silver (Troy ounces)	Copper (Short tons)	Lead (Short tons)
Lode ore:						
Gold 2/	1	49,999	1,750	7,000	--	--
Gold-Silver	2	W	W	W	W	W
Silver	7	W	W	W	W	W
Total	10	W	W	278,887 2/	W	W
Copper	17	134,640,683	54,534	4,131,928	685,239 3/	63
Total	17	134,640,683	54,534	4,131,928	685,239	63
Other lode material:						
Gold-silver tailings	--	W	W	W	W	W
Silver tailings	--	W	W	W	--	--
Copper precipitates	5	83,563	--	--	56,439	--
Copper tailings	1	W	--	--	W	--
Total	6	W	W	80,717 2/	W	W
Total lode	27	135,301,652 2/	W	4,491,532 2/	747,604 2/	159 2/
Placer	1	--	W	--	--	--
GRAND TOTAL	28	135,301,652 2/	61,991 2/	4,491,532 2/	747,604 2/	159 2/

(Continued)

TABLE X

(Continued)

Source: "Minerals Yearbook - Area Reports; Domestic 1983", U.S. Bureau of Mines (Preliminary Data)

W Withheld to avoid disclosing company proprietary data.
1/ Detail may not add to totals shown because some mines produce more than one class of material. Operations from which metals are recovered only from tailings or precipitates are not counted as producing mines.
2/ Includes items indicated by symbol W.
3/ Includes copper recovered from precipitates of ore leached.

TABLE XI

NONFUEL MINERAL PRODUCTION IN ARIZONA 1/

MINERAL	1982 Quantity	1982 Value (thousand)	1983 P Quantity	1983 P Value (thousand)
Clays----------thousand short tons-------	143	$ 998	151	$ 1,425
Copper (recoverable content of ores, etc.) short tons----	848,251 R	1,235,055 R	747,604	1,144,285
Gem stones----------	NA	2,800	NA	2,800
Gold (recoverable content of ores, etc.) troy ounces-----	61,050	22,949	61,991	26,284
Gypsum----------thousand short tons--------	175	1,205	265	1,929
Lead (recoverable content of ores, etc.) short tons------	396	202	159	69
Lime----------thousand short tons--------	326	77,080	340	16,700
Molybdenum (content of concentrate) thousand pounds------	20,445 R	89,928 R	23,934	79,459
Pumice----------thousand short tons--------	1	7	2	15
Sand and gravel----------do----------	19,231	59,992	23,200	75,000
Silver (recoverable content of ores, etc.) thousand troy ounces-------	6,309 R	50,159 R	4,492	51,383
Stone:				
Crushed----------thousand short tons--------	5,200	22,200	4,755	24,079
Dimension----------do----------	W	580	2/	1
Combined value of cement (masonry & portland), perlite, pyrites, salt, and values indicated by symbol W.	XX	79,105	XX	87,449
Total	XX	$1,582,260 R	XX	$1,510,878

Source: "The Mineral Industry of Arizona", Minerals Yearbook U.S. Bureau of Mines, 1983.

P Preliminary
R Revised
NA Not Available
W Withheld to avoid disclosing company proprietary data; value included in "Combined Value" figure.
XX Not Applicable.
1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
2/ Less than ½ unit.

TABLE XII

COPPER MINE CAPACITY IN ARIZONA 1/
(Short tons of Recoverable Copper/Year)

OPERATOR	MINE	CAPACITY
Phelps Dodge	Morenci	155,000
Anamax	Twin Buttes	135,000 2/
Magma	San Manuel	130,000
Kennecott	Ray	114,000
Duval	Sierrita	102,000
Cities Service/Pinto Valley	Pinto Valley	85,000
Cyprus	Bagdad	76,000
Phelps Dodge	Metcalf	65,000
Inspiration	Inspiration Area	55,000
Phelps Dodge	New Cornelia	45,000
Cyprus	Pima	45,000
Magma	Superior (Magma)	42,500
ASARCO 3/	Mission	35,000
ASARCO	Silver Bell	23,500
Duval	Esperanza	22,500
ASARCO	Sacaton	22,000
Noranda	Lakeshore	21,000
Duval	Mineral Park	17,000
ASARCO 3/	Eisenhower	13,000
ASARCO 3/	San Xavier	9,000
Inspiration	Christmas	8,500
Ranchers	Bluebird	8,000
Cities Service/Pinto Valley	Miami	6,000
Cyprus	Johnson	5,500
Phelps Dodge	Copper Queen/Lavender	3,500
Inspiration	Ox Hide	2,500
Cities Service/Pinto Valley	Copper Cities	2,000
TOTAL		1,248,500

Source: Arizona Department of Mines & Mineral Resources file data; Company Annual Reports and Form 10-K; Professional Publications.

1/ Figures generally represent a current estimate of the productive capacity of primary recoverable copper in concentrates, precipitates, and cathodes. Figures do not represent smelter or refinery capacity. The estimates are based on recent production figures and on capacities of concentrator and leach plant facilities. Other factors affecting actual production include, for example, grade of ore and recovery. Some capacities have been published by the reporting company.

2/ Includes approximately 33,000 tons of copper concentrated annually from ore obtained at the Eisenhower mine.

3/ The Mission mill treats ore from the Mission, San Xavier and ASARCO's share of Eisenhower mine production.

TABLE XIII

MINE PRODUCTION OF RECOVERABLE COPPER IN THE UNITED STATES

(Short Tons)

STATE	1982	Rank In 1982	1983	Rank In 1983
ARIZONA	842,650	1	755,446	1
IDAHO	3,491	6	3,928	5
MISSOURI	8,976	5	8,581	4
MONTANA	70,667	4	37,577	3
NEW MEXICO	81,421	3	1/	1/
UTAH	206,925	2	187,062	2
OTHER STATES 1/	39,405		160,085	
TOTAL	1,253,535		1,152,679	

Source: American Bureau of Metal Statistics, Inc. Non-Ferrous Metal Data 1983, p. 25. Derived from U. S. Bureau of Mines data.

1/ Includes California, Colorado, Maine, Michigan, Nevada, Oregon, Tennessee and Washington. New Mexico in 1983.

TABLE XIV

COPPER SMELTERS IN NORTH AMERICA

End Of 1983-Short Tons

Company	Location Of Plant	Annual Capacity
	United States	
ASARCO Incorporated	Hayden, Ariz.	960,000
	El Paso, Texas	576,000
	Tacoma, Wash.	600,000
Chemetco Inc.	Alton, Illinois	150,000
Copper Range Company		
White Pine Copper Division	White Pine, Mich.	70,000
Inspiration Consolidated		
Copper Company	Inspiration, Ariz.	450,000
Kennecott		
Chino Mines Company	Hurley, N.M.	300,000
Nevada Mines Division	Mcgill, Nev.	255,000
Ray Mines Division	Hayden, Ariz.	360,000
Utah Copper Division	Garfield, Utah	820,000
Magma Copper Company		
San Manuel Division	San Manuel, Ariz.	800,000
Phelps Dodge Corporation		
Douglas Smelter	Douglas, Ariz.	500,000
Morenci Branch	Morenci, Ariz.	650,000
New Cornelia Branch	Ajo, Ariz.	190,000
Tyrone Branch	Playas, N.M.	750,000
Tennessee Chemical Company	Copperhill, Tenn.	18,000
United States Metals Refining		
Co., A Subsidiary Of AMAX Inc.	Carteret, N.J.	250,000
Total (a)		**7,699,000**
	Canada	
Falconbridge Ltd.	Falconbridge, Ont.	700,000
Gaspe Mines	Murdochville, Que.	357,000
Hudson Bay Mining & Smelting		
Company Ltd.	Flin Flon, Manitoba	520,000
Inco Ltd.	Copper Cliff, Ont.	2,400,000
Noranda Mines, Ltd.	Noranda, Que.	1,000,000
Total (a)		**4,977,000**
	Mexico	
Cia. Minera De Santa Rosalia, S.A.	Santa Rosalia, Baja, Calif.	100,000
Compania Minera De Cananea, S.A.	Cananea, Son.	277,000
Industrial Minera Mexico, S.A.	San Luis Potosi	300,000
Total (a)		**677,000**

Source: American Bureau of Metal Statistics Inc.
The capacity of copper smelting works is given as estimated by the respective proprietors.
(a) Tons of material.
(b) Tons of product.

TABLE XV

Copper Production Of Companies (g)

Short Tons

	1979	1980	1981	1982	1983
			United States		
Anaconda Copper Company (own mines) (d)	152,077	92,718	149,257	164,291	43,243
Anamax Mining Company	147,531	115,282	135,175	145,290	49,108
ASARCO Incorporated	96,333	56,444	112,694	119,615	110,746
Cominco American Incorporated					
Copper Range Company					
White Pine Copper Division (f)	43,735	35,770	43,362	22,600	26,575
And Dresser Minerals (e)	3,128	2,813	2,058	2,033	869
Cyprus Bagdad Copper Company	65,545	63,960	71,507	86,623	81,033
Cyprus Johnson Copper Company	5,016	5,151	5,347	4,851	4,859
Cyprus Pima Mining Company	8,532	27,966	40,632	20,201	-
Day Mines Inc.	n.a.	1,996	(l)	(l)	(l)
Coeur Mines	n.a.	55	(l)	(l)	(l)
Galena Mine	n.a.	261	(l)	(l)	(l)
Victoria Mine	n.a.	1,680	(l)	(l)	(l)
Duval Corporation	132,255	144,640	130,555	58,027	71,510
Hecla Mining Company (a)	649	494	1,566	1,159	1,283
Coeur Mine (j)	n.a.	n.a.	59	60	56
Consolidated Silver (m)	n.a.	3	43	2	-
Galena Mine (k)	n.a.	n.a.	316	330	307
Lucky Friday Mine	421	442	374	666	756
Sunshine Mine	228	52	235	101	164
Victoria Mine	n.a.	n.a.	539	-	-
Inspiration Consolidated Copper Company (f)	46,083	40,812	64,700	54,699	40,778
Kennecott Minerals Company (U.S. mines)	387,774	335,914	372,213	285,716	318,000
Magma Copper Company (f)	155,135	99,340	165,560	132,374	99,705
Superior Division	39,084	22,969	42,462	25,633	-
San Manuel Division	116,051	76,371	123,098	106,741	99,705
Noranda Lakeshore Mines, Inc. (b)	-	-	13,035	22,800	18,760
Phelps Dodge Corporation (U.S. mines) (b)	342,900	267,800	315,700	150,100	263,100
Pinto Valley Copper Corporation	77,416	52,819	92,311	56,848	10,264
Ranchers--Exploration And Development Corp.	5,982	7,115	6,663	3,998	-
Bluebird Mine	5,480	6,550	6,663	3,998	-
Old Reliable Mine (i)	502	565	-	-	-
Tennessee Chemical Company	13,998	10,938	12,619	11,685	11,725
Refiners (c)	548,892	380,314	529,087	465,987	401,567
AMAX Copper, Inc.	217,937	155,581	169,275	147,509	126,799
ASARCO Incorporated	330,955	224,733	359,812	318,478	274,768

(a) Includes Hecla's share of production from each mining property.
(b) Includes copper produced from purchased ores.
(c) The totals for these concerns are to a large extent duplications of the reports of other producers.
(d) Includes Anaconda's 50% share of Anamax Mining Company.
(e) Magmont mine.
(f) Refined production.
(g) Copper content of mine production unless otherwise noted.
(h) Mine abandoned in 1979.
(i) Mine abandoned in 1981.
(j) Operated by ASARCO - Shows Hecla Mines share of 5%.
(k) Operated by ASARCO - Shows Hecla Mines share of 25%.
(l) On October 20, 1981, Day Mines, Inc. merged into a subsidiary of Hecla Mining Company.
(m) Operated by Hecla Mining Company - Shows Hecla's 64% share.

Source: Non-Ferrous Metal Data 1983, p. 22. American Bureau of Metal Statistics Inc.

TABLE XVI

Imports Of Copper Into The United States

Short Tons

	1979	1980	1981	1982	1983
Ore, Matte And Regulus, Copper Content	25,182	16,007	36,036	108,133	102,803
Unrefined Black, Blister & Converter Copper In Pigs, Bars, Etc	75,107	51,780	81,268	114,021	87,588
Refined Copper In Cathodes, Ingots, Plates, Or Bars	237,174	504,983	391,208	313,909	532,397
Waste & Scrap (unalloyed)	16,150	17,696	19,443	18,056	25,450
Waste & Scrap (alloyed)	15,898	14,887	19,334	20,760	34,597

Source: U.S. Bureau of the Census.

Exports Of Copper From The United States

Short Tons

	1979	1980	1981	1982	1983
Ore, Concentrates & Unrefined, Copper Content	49,124	117,755	166,207	215,256	47,110
Refined In Ingots, Bars Or Other Forms	88,697	18,938	30,946	38,554	96,482
Refined Copper (re-exports)	1,351	4,910	35,081	1,178	718
Waste & Scrap (a)	59,614	67,469	55,202	59,987	52,897
Pipes & Tubes (a)	9,399	19,458	12,059	5,047	3,991
Plates & Sheets (a)	724	2,032	2,573	13,038	1,511
Wire & Cable, Bare	8,591	6,937	7,742	8,326	9,163
Semi-Fabricated Forms	21,449	45,272	20,338	19,394	10,404
Insulated Copper Wire & Cable (b)	93,440	69,727	89,538	70,070	67,714

Source: U.S. Bureau of the Census.
(a) Metal weight; chiefly copper.
(b) Gross weight.

Imports Of Copper Into The United States By Countries

Short Tons

	1979	1980	1981	1982	1983
Ore, Matte And Regulus					
Canada	4,810	2,720	2,393	22,850	41,302
Mexico	210	25	12,412	57,814	34,352
Honduras	–	–	–	–	2,260
Nicaragua	2	–	–	–	–
Bolivia	–	–	–	14	26
Chile	544	515	217	5,423	7,595
Peru	1,643	1,440	3,115	1,093	4,406
Netherlands	–	–	–	–	433
Japan	–	–	–	–	11
Philippines	16,896	9,807	16,921	17,605	9,269
Saudi Arabia	–	–	60	–	–
Botswana	–	–	–	–	1
South Africa	–	–	–	59	364
Zimbabwe	–	–	–	6	–
Australia	1,075	1,500	918	3,269	2,784
Other Countries	–	–	–	–	–
Total	**25,182**	**16,007**	**36,036**	**108,133**	**102,803**

(continued next page)

TABLE XVI (continued)

Imports Of Copper Into The United States By Countries (continued)

Short Tons

	1979	1980	1981	1982	1983
Unrefined Black, Blister And Converter Copper In Pigs, Bars, Etc.					
Canada	7,659	4,358	27	29,542	4,546
Mexico	3,511	1,022	8,046	4,772	10,206
Argentina	–	–	–	–	1,808
Bolivia	565	–	–	–	–
Chile	34,731	21,197	41,825	67,172	66,255
Peru	24,294	17,675	17,799	11,213	3,804
Belgium	1,764	35	23	1,147	–
Germany, F.R.	–	–	38	116	19
Sweden	1,356	–	1,087	–	–
United Kingdom	–	–	20	11	–
Japan	17	2,999	3,855	–	–
Egypt	–	–	–	–	854
Australia	1,210	4,494	8,548	–	–
Other Countries	–	–	–	48	97
Total	**75,107**	**51,780**	**81,268**	**114,021**	**87,589**
Cathodes, Ingots, Plates, Or Bars					
Canada	70,352	144,263	93,548	72,046	100,667
Mexico	346	2,878	4,816	3,111	–
Argentina	–	551	1,102	–	–
Chile	92,098	117,471	149,480	182,003	297,368
Peru	32,295	38,776	52,576	14,920	34,458
Belgium	803	–	2,133	1,166	6,364
France	105	40	60	–	20
Germany, F.R.	6,635	445	145	7	1,098
Norway	219	533	416	2,265	280
Spain	–	88	–	–	–
Sweden	8,261	20	20	20	–
United Kingdom	888	60	643	358	346
Yugoslavia	3,759	5,006	2,698	–	–
Japan	–	115,448	7,062	15	10,121
South Korea	–	–	–	2,205	3,307
Ghana	–	–	–	–	3,816
South Africa	2,206	2,396	–	–	15,113
Tanzania	55	–	–	–	–
Zaire	1,621	5,517	27,212	24,535	32,081
Zambia	17,477	71,491	49,144	10,368	27,219
U.S.S.R.	–	–	–	728	–
Hungary	–	–	–	60	–
Other Countries	54	–	153	102	140
Total	**237,174**	**504,983**	**391,208**	**313,909**	**532,398**

Source: U.S. Bureau of the Census

TABLE XVII

"COVERED EMPLOYMENT" AND WAGES IN ARIZONA COPPER MINING AND SMELTING

Year	Average No. Covered Employees 1/	Total Wages	Average Annual Wage	Average Weekly Wage	Tons Copper Ore 2/
1948	11,493	$ 41,318,524	$3,595	$ 69.13	39,072,204
1949	11,001	40,612,224	3,692	71.00	37,365,611
1950	10,181	41,994,321	4,125	79.33	41,757,273
1951	10,754	47,825,698	4,447	85.52	42,784,388
1952	11,365	54,950,235	4,835	93.14	44,472,522
1953	12,068	62,742,982	5,199	99.98	45,187,838
1954	12,502	65,518,853	5,241	100.79	43,072,894
1955	12,399	71,293,263	5,750	110.58	52,189,728
1956	14,008	83,568,996	5,966	114.73	60,468,580
1957	14,652	85,125,320	5,809	111.71	59,571,834
1958	14,100	74,726,972	5,300	101.93	56,255,809
1959	11,568	72,095,130	6,232	119.85	53,121,545
1960	13,764	90,312,848	6,562	126.19	66,032,439
1961	14,275	97,271,286	6,814	131.04	71,918,991
1962	14,408	101,920,108	7,074	136.04	78,868,147
1963	14,303	104,291,588	7,292	140.23	80,615,132
1964	14,720	113,792,031	7,730	148.65	86,132,039
1965	15,239	122,163,124	8,016	154.16	92,859,535
1966 1/	17,018	137,187,611	8,061	155.02	101,558,298
1967	13,426	108,427,206	8,076	155.31	74,289,203
1968	15,734	136,089,579	8,649	166.33	101,293,963
1969	19,459	173,183,018	8,900	171.15	127,848,828

-continued-

TABLE XVII CONTINUED

"COVERED EMPLOYMENT" AND WAGES IN ARIZONA COPPER MINING AND SMELTING

Year	Average Covered Employees 1/	Total Wages	Average Annual Wage	Average Weekly Wage	Tons Copper Ore 2/
1970	21,479	$ 201,665,064	$ 9,389	$180.56	150,241,000
1971	21,231	211,978,597	9,984	192.00	149,294,000
1972	23,233	254,717,341	10,964	210.85	165,914,825 2/
1973	25,494	291,294,328	11,426	218,89	181,311,945
1974	27,894	340,832,096	12,219	234.98	178,913,296
1975	25,950	363,349,178	14,002	269.27	168,750,152
1976	25,631	405,289,034	15,812	304.08	194,136,559
1977	23,373	398,539,789	16,835	323.75	168,641,401
1978	21,092	397,790,419	18,860	362.69	178,204,491
1979	23,239	494,963,476	21,299	409.60	203,997,408
1980	21,602	510,168,454	23,617	454.17	169,650,401
1981	26,031	687,434,798	26,408	507.85	216,787,430
1982	17,182	487,415,292	28,368	545.53	135,768,647
1983	13,864	395,266,852	28,510	548.29	135,301,652

Source: This report, Table XVII; "Minerals Yearbook - Area Reports: Domestic", U.S. Bureau of Mines; Research and Statistics Unit, Arizona Department of Economic Security.

1/ "Covered Employment" by law includes all employees of employers of three or more persons. Prior to 1966 only a portion of the workers in smelting, refining, and rod fabrication were included in this table.

2/ Mine production in short tons of lode ore from "Arizona, Mine Production by Class of Ore", reported by U. S. Bureau of Mines. In 1982 and thereafter the tonnage may include copper-zinc, copper-lead and lead-zinc ore combined to avoid disclosing individual company confidential data.

TABLE XVIII

ARIZONA INDUSTRIES COVERED BY SOCIAL SECURITY

YEAR - 1983

Industry	Average Number of Employees 1/	Total Wages	Average Annual Wage	Average Weekly Wage
Copper Mining	11,384	324,857,691	28,536	548.76
Copper Smelting, Refining & Rod Fabrication	2,480	70,409,161	28,391	545.98
TOTAL COPPER MINING & PROCESSING	13,864	395,266,852	28,510	548.28
Other Mining, Quarrying & Processing	2,874	78,853,999	27,437	527.64
ALL MINING, QUARRYING & PROCESSING	16,738	474,120,851	28,326	544.73
Mfg. Except Copper Processing	153,529	3,321,016,957	21,631	415.98
Construction	79,642	1,521,577,945	19,105	367.40
Transportation, Utilities, etc. 2/	49,648	1,135,493,360	22,871	439.82
Wholesale-Retail Trade	260,910	2,327,163,358	8,919	171.53
Services, Finance & Misc.	296,820	4,498,905,873	15,157	291.48
Agriculture & Related Services	26,735	270,317,260	10,111	194.44
Federal, State & Local Government	193,160	3,547,795,767	18,367	353.21
TOTAL AND AVERAGES	1,077,182	17,096,391,371	15,871	305.21

Source: Research and Statistics Unit, Arizona Department of Economic Security.

1/ Includes all covered employees.

2/ Transportation exclusive of railroads.

TABLE XIX

EMPLOYMENT, EARNINGS AND HOURS IN COPPER MINING

IN THE UNITED STATES AND ARIZONA 1/

Period	All Employees: Average No. (Thousands) 2/ Ariz.	All Employees: Average No. (Thousands) 3/ U.S.	PRODUCTION WORKERS: Average No. (Thousands) 4/ Ariz.	PRODUCTION WORKERS: Average No. (Thousands) 5/ U.S.	Average Weekly Earnings: Ariz.	Average Weekly Earnings: U.S.	Average Weekly Hours: Ariz.	Average Weekly Hours: U.S.	Average Hourly Earnings 6/ Ariz.	Average Hourly Earnings 6/ U.S.	Average Earnings Per Man Per Year 7/ Ariz.	Average Earnings Per Man Per Year 7/ U.S.	Aggregate Man-Hours (Thousands) 8/ Ariz.	Aggregate Man-Hours (Thousands) 8/ U.S.
1970	18.8	37.0	14.9	29.5	173.01	175.67	43.8	44.7	3.95	3.93	8,997	9,135	33,936	68,570
1971	18.9	34.7	14.9	26.8	178.50	178.46	42.4	42.9	4.21	4.16	9,282	9,280	32,852	59,785
1972	20.5	38.9	16.1	30.7	194.69	192.19	41.6	41.6	4.68	4.62	10,124	9,994	34,827	66,410
1973	21.5	42.3	17.6	33.7	206.75	206.42	41.6	42.3	4.97	4.88	10,751	10,734	38,072	74,127
1974	24.0	42.8	19.1	33.8	222.16	226.46	39.6	41.1	5.61	5.51	11,552	11,776	39,331	72,237
1975	22.5	37.1	17.9	28.4	247.43	247.14	38.6	39.2	6.41	6.33	12,866	12,903	35,929	57,891
1976	21.7	35.5	17.2	27.0	286.31	280.70	40.1	40.1	7.14	7.00	14,888	14,596	35,865	56,300
1977	19.3	35.1	15.3	26.9	302.99	288.73	39.4	38.6	7.69	7.48	15,755	15,014	31,347	53,994
1978	17.2	35.2	13.7	26.9	344.76	338.40	40.8	40.0	8.45	8.46	17,928	17,597	29,066	55,952
1979	19.3	31.9	15.3	24.6	404.81	405.03	42.3	42.5	9.57	9.53	21,050	21,061	33,654	54,366
1980	17.7	29.4	14.0	22.6	446.19	435.01	41.7	41.0	10.70	10.61	23,202	22,621	30,358	48,183
1981	21.9	36.2	17.4	27.9	497.28	492.54	41.2	41.6	12.07	11.84	25,859	25,612	37,278	60,353
1982	15.2	25.3	12.1	18.5	495.60	484.91	38.3	38.7	12.94	12.53	25,771	25,215	24,098	37,229
1983	11.3	19.8	9.0	14.2	519.25	522.69	39.1	39.9	13.28	13.10	27,001	27,180	18,299	29,462

TABLE XIX CONTINUED

EMPLOYMENT EARNINGS AND HOURS IN COPPER MINING

IN THE UNITED STATES AND ARIZONA

	Copper Ore Mined (Thousand Short Tons)		Copper Produced (Recoverable Content) (Thousand Pounds)		Worker Productivity: Copper Ore Mined per man-hour (tons)		Worker Productivity: Copper Produced per man-hour (pounds)	
Period	Ariz.	U.S.	Ariz.	U.S.	Ariz.	U.S.	Ariz.	U.S.
1970	150,241	257,729	1,826,734	3,368,957	4.427	3.759	53.829	49.132
1971	149,294	242,656	1,633,568	2,986,599	4.544	4.059	49.725	49.996
1972	165,815	266,831	1,816,118	3,264,113	4.761	4.017	52.161	49,151
1973	173,605	289,998	1,847,635	3,386,357	4.872	3.912	48.530	45.683
1974	178,821	293,443	1,710,744	3,145,148	4.547	4.062	43.496	43.539
1975	168,656	263,003	1,619,535	2,772,111	4.694	4.543	45.076	47.885
1976	194,046	283,736	2,043,168	3,166,889	5.410	5.040	56.968	56.250
1977	168,601	259,974	1,843,949	2,964,539	5.379	4.815	58.824	54.905
1978	178,201	263,722	1,965,072	2,955,210	6.131	4.713	67.607	52.817
1979	203,977	291,078	2,085,556	3,140,110	6.061	5.369	61.971	57.759
1980	169,650	241,090	1,669,495	2,527,920	5.588	5.004	54.994	52.465
1981	216,787	306,089	2,294,437	3,354,548	5.815	5.072	61.549	55.582
1982	146,125	200,589	1,697,500	2,507,070	6.064	5.388	70.442	67.342
1983	152,902 1/	196,203 2/	1,514,538 1/	2,288,612	8.356	6.660	82,766	77.680

Source: Research and Statistics Unit, Arizona Department of Economic Security; "Minerals Yearbook -- Metals, Minerals," U.S. Bureau of Mines. "Employment and Earnings", March issues, U.S. Department of Labor

1/ Table I this publication.

2/ U.S. Bureau of Mines

TABLE XIX CONTINUED

EMPLOYMENT, EARNINGS AND HOURS IN COPPER MINING

IN THE UNITED STATES AND ARIZONA 1/

1/ Statistics do not reflect workers in copper smelting, refining and rod fabrication.

2/ These figures are estimates made by the Arizona Department of Economic Security, in cooperation with the U.S. Bureau of Labor Statistics, and they include all full and part-time wage and salary workers who were employed in copper mining in any part of the pay periods which included the 12th of each month of the year.

3/ Estimates made by the U.S. Bureau of Labor Statistics, in cooperation with the 50 states, and based upon monthly samplings similar to those in 2/ above, adjusted periodically to census bench marks.

4/ Estimates of production (non-supervisory) workers based upon samplings as in 2/ above. Since 1975, figures have been calculated by the Arizona Department of Mines and Mineral Resources dividing the annual number of "All Employees - Arizona" by a factor of 1.26. This factor was derived by comparing the annual number of "All Employees - Arizona" with "Production Workers - Arizona" from 1970 to 1974.

5/ Earnings figures for a particular year is the product of "Average Hourly Earnings" and "Average Weekly Hours" for that year.

6/ Gross payroll aggregates, exclusive of irregular bonuses and other pay not earned in a sample pay period, are divided by gross man-hour aggregates of production and related workers for the period in order to determine average hourly earnings.

7/ "Average Weekly Earnings" times 52 weeks.

8/ Number of production workers times "Average Weekly Hours" times 52 weeks.

TABLE XX

REFINED COPPER INVENTORIES AT MONTH END
AMOUNTS IN THOUSANDS OF SHORT TONS

U. S. STOCKS

1981	Jan	261.6	Mar	236.8	May	243.4	Jul	276.9	Sep	275.5	Nov	301.2
	Feb	249.4	Apr	245.5	Jun	264.7	Aug	276.0	Oct	281.6	Dec	338.6
1982	Jan	351.9	Mar	387.3	May	422.5	Jul	463.7	Sep	436.2	Nov	470.8
	Feb	375.9	Apr	409.8	Jun	448.1	Aug	449.9	Oct	438.2	Dec	484.5
1983	Jan	489.6	Mar	508.9	May	519.4	Jul	509.0	Sep	509.1	Nov	505.2
	Feb	501.6	Apr	524.1	Jun	498.7	Aug	522.7	Oct	514.2	Dec	475.3

STOCKS OUTSIDE U. S.

1981	Jan	485.2	Mar	463.0	May	449.8	Jul	454.9	Sep	433.4	Nov	403.0
	Feb	471.0	Apr	458.8	Jun	446.0	Aug	454.7	Oct	419.4	Dec	432.5
1982	Jan	446.3	Mar	459.5	May	459.0	Jul	492.0	Sep	521.7	Nov	642.9
	Feb	448.4	Apr	452.2	Jun	479.3	Aug	504.4	Oct	592.3	Dec	699.9
1983	Jan	760.8	Mar	759.1	May	780.0	Jul	683.0	Sep	767.2	Nov	810.4
	Feb	766.4	Apr	795.5	Jun	722.2	Aug	757.4	Oct	765.2	Dec	832.5

WORLD STOCKS

1981	Jan	746.8	Mar	699.8	May	693.2	Jul	731.8	Sep	708.9	Nov	704.2
	Feb	720.4	Apr	704.3	Jun	710.7	Aug	730.7	Oct	701.0	Dec	771.1
1982	Jan	798.2	Mar	846.8	May	881.5	Jul	955.7	Sep	957.9	Nov	1,113.7
	Feb	824.3	Apr	862.0	Jun	927.4	Aug	954.3	Oct	1,030.5	Dec	1,184.4
1983	Jan	1,250.4	Mar	1,268.0	May	1,299.4	Jul	1,192.0	Sep	1,276.3	Nov	1,315.6
	Feb	1,268.0	Apr	1,319.6	Jun	1,220.8	Aug	1,280.1	Oct	1,279.4	Dec	1,307.8

Source: American Bureau of Labor Statistics

Prepared by: JLBC Staff

Date: September 5, 1984

TABLE XXI

AVERAGE QUOTED PRICE OF 1/

ELECTROLYTIC COPPER WIREBAR

DOMESTIC, DELIVERED

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
January	52.388	68.753	69.028	62.625	66.240	62.625	76.574	119.385	88.570	78.634	80.219
February	54.571	68.575	64.180	63.625	68.625	63.593	89.697	133.808	86.071	78.779	84.024
March	59.806	68.575	64.180	64.682	72.551	62.410	96.718	106.040	87.382	75.862	82.072
April	60.083	68.575	64.180	69.241	74.393	64.625	98.322	94.851	88.033	76.273	83.493
May	60.083	81.459	63.780	70.625	72.606	64.768	91.234	93.479	85.798	77.948	85.634
June	60.083	86.245	62.136	70.625	71.199	66.569	88.241	92.713	85.226	71.488	81.836
July	60.083	86.596	62.484	74.625	67.996	64.079	86.768	103.565	84.412	71.053	82.947
August	60.083	86.596	63.790	74.625	63.792	67.232	91.335	100.708	87.387	70.999	80.542
September	60.083	83.663	63.790	74.625	60.625	67.632	95.853	98.864	84.722	71.065	77.587
October	60.083	78.428	63.790	72.064	60.625	70.495	99.106	99.471	82.312	72.413	73.392
November	60.163	76.249	63.790	70.625	60.625	71.191	99.708	96.982	81.216	72.968	69.581
December	66.367	73.572	63.790	65.774	61.942	71.897	106.448	89.127	80.293	74.230	70.805

Source: Metals Week

1/ MW US Producer Delivered.

Prepared by: JLBC Staff

TABLE XXII

Estimated production costs for producing copper mines,[1] per pound of refined copper

Type of operation and country	Number of mines	Mine cost	Mill cost[2]	Smelter-refinery cost[3]	Total operating cost[4,5]	Taxes[6]	Byproduct credits	Net cost[7]	Total cost,[8,9] FOB refinery
Surface:									
Canada	10	$0.42	$0.44	$0.27	$1.13	$0.00	$0.29	$0.87	$1.04
Chile	3	.28	.15	.26	.69	.10	.19	.60	.76
Peru	4	.23	.28	.31	.82	.12	.06	.88	1.12
Philippines	6	.33	.36	.27	.96	.09	.14	.91	1.04
Zaire	3	.19	.11	.30	.60	.22	.12	.70	.79
Other countries	12	.24	.30	.27	.81	.14	.34	.61	.81
Total or average, foreign countries[5]	38	.26	.24	.28	.77	.13	.21	.69	.85
United States	19	.30	.28	.38	.96	.05	.16	.86	1.02
Total or average, all countries[5]	57	.27	.25	.31	.83	.11	.20	.74	.91
Underground:									
Australia	4	.22	.12	.39	.73	.06	.09	.73	.89
Canada	10	.32	.14	.83	1.29	.07	.92	.44	.61
Chile	4	.36	.19	.20	.75	.04	.06	.72	.79
Philippines	5	.41	.33	.28	1.02	.10	.40	.72	.85
Zaire	3	.42	.16	.38	.97	.24	.15	1.05	1.14
Zambia	6	.41	.20	.27	.87	.17	.03	1.01	1.09
Other countries	20	.57	.24	.58	1.38	.12	.88	.63	.92
Total or average, foreign countries[5]	52	.36	.19	.32	.88	.09	.21	.77	.88
United States	5	.54	.31	.35	1.20	.07	.10	1.18	1.26
Total or average, all countries[5]	57	.40	.20	.32	.92	.09	.19	.82	.93
Grand total or average:[5]									
Foreign countries	90	.31	.22	.30	.82	.11	.21	.73	.87
United States	24	.35	.29	.37	1.01	.05	.15	.92	1.07
All countries	114	.32	.23	.32	.87	.10	.20	.77	.92

[1] Does not include mines having combined surface and underground operations. Average ore grade and annual refined copper production in table 13.
[2] Does not include mines having leach facilities only. Mines having combined float and leach operations are included.
[3] Includes smelting and refining charges, transportation costs to the smelter and refinery (but not to market), and postmill processing charges for other (noncopper) commodities.
[4] Summation of mine, mill, and smelter-refinery costs.
[5] Data may not add to totals shown because of independent rounding.
[6] Includes property, severance, State, and Federal taxes and royalties.
[7] Total operating cost plus taxes less byproduct credits.
[8] Net cost plus recovery of capital and profit at a 15-pct ROR.
[9] Transportation charges from the refinery to the market are not included. These costs are estimated in table 15.

Source: IC 8930 - Bureau of Mines Information Circular/1983
"Copper Availability - Market Economy Countries" Table 14, p. 18

TABLE XXIII

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
ANAMAX MINING COMPANY	Helvetia	Sulfide	320	0.64	Publ. 1973; cutoff at 0.3% Cu
	Helvetia	Oxide	20	0.55	Publ. 1973; acid soluble Cu; cutoff at 0.3% acid soluble Cu.
	Peach Elgin	Mixed	23	0.75	Publ. 1973; cutoff at 0.4% Cu.
	Twin Buttes & Palo Verde	Sulfide	113	0.67	Publ. in Amax Inc. 1983 Annual Report.
	Twin Buttes & Palo Verde	Oxide	12	1.08	Publ. in Amax Inc. 1983 Annual Report.
ASARCO Inc.	Mission	Sulfide	81.243	0.75	With 0.17 Ag oz/ton. Publ. ASARCO 1983 Annual Report.
	Poston Butte	Mixed		0.47	32-42 million tons possible. Publ. E & MJ 1972.
	Sacaton East (UG)	Sulfide	15.960	1.20	Publ. in ASARCO Inc. 1983 Annual Report.
	San Xavier	Sulfide	159.149	0.51	With .08 oz/ton Ag. Publ. in 1983 Annual Report.
	Silver Bell	Sulfide	21.722	0.68	With .07 oz/ton Ag. Publ. in 1983 Annual Report.
	Silver Bell	Oxide			
AZTEC MINING CORP.	Mame	Oxide	2	1.00	Unpublished estimate.
CASA GRANDE COPPER COMPANY	Casa Grande	Mixed	352	1.00	Publ. in Getty Oil Co. 1980 Annual Report.

TABLE XXIII (Cont.)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
CITIES SERVICE COMPANY	Cactus	Oxide			
	Copper Cities	Oxide			
	Miami	Oxide			
	Miami East	Mixed (?)	5.976	3.14	Pub. in Newmont Mining 1983 Annual Report
	Old Dominion	Sulfide			
	Pinto Valley	Sulfide	384.176	0.404	Pub. in Newmont Mining 1983 Annual Report
COCHISE DEV. GROUP	Bisbee-North	Mixed (?)	20	0.80	Unpublished estimate.
COCHISE MINING CORP.	San Juan	Oxide	20	0.50	Unpublished estimate.
CONTINENTAL OIL CO.	Poston Butte	Mixed	800	0.40	Pub. 1979 from Copper Studies Inc.
CYPRUS MINES CORP.	Bagdad	Sulfide	326	0.50	With 0.03 Mo.
	Bagdad	Oxide	38	0.33	Acid soluble Cu.
	Bruce	Sulfide	0.1276	3.73	Pub. 1976 in Form 10-K with 12.8% Zn.
	I-10	Mixed	100	0.52	Unpublished estimate; with 0.02% Mo.
	Johnson	Oxide	3.926	0.40	Acid soluble Cu. Pub. in 1984 E&MJ. International Directory
	Pima	Sulfide	120.767	0.482	Pub.1983 E&MJ International Directory.
DUVAL CORPORATION	Esperanza	Sulfide	48.783	0.27	With .034% Mo.
	Mineral Park	Sulfide	35.577	0.17	With .054% Mo.
	Sierrita	Sulfide	328.759	0.30	With .035% Mo. Pub. in 1984 E&MJ Int. Dir.

TABLE XXIII (Cont.)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
EISENHOWER MINING CO.	Palo Verde (Anamax)	Sulfide	93.118	0.62	With 0.14 oz/ton Ag calculated.
	Palo Verde (ASARCO)	Sulfide	28.694	0.81	With 0.23 oz/ton Ag. Published in ASARCO 1983 Annual Report
EL PASO COMPANY	Emerald Isle	Oxide	1.5	0.40	3 million tons at 0.1% Cu. USBM RI 8236, Pub. 1977.
FREEPORT-McMORAN INC.	Santa Cruz	Mixed			
INSPIRATION CONSOLIDATED COPPER COMPANY	Christmas (OP)	Sulfide	7.567	0.63	Pub. in Inspiration Resources 1983 Form 10-K, p. 8
	Christmas (OP)	Oxide			
	Christmas (UG)	Sulfide	20.131	1.82	(Same as above)
	Inspiration Area Mines	Mixed	189.695	0.52	(Same as above)
	Ox Hide	Oxide	28.573	0.30	(Same as above)
	Sanchez	Oxide	79.362	0.36	(Same as above)
KENNECOTT	Chilito	Mixed			
	Lone Star	Mixed	2000	0.41	Reported at Ariz. Conference AIME 12/77
	Lone Star Ext.	Mixed			
	Ray	Sulfide	606.144	0.70	With .01% Mo. Pub. in "World Mining" 5/81
	Ray	Silicate	225.760	0.68	Pub. in "World Mining" 5/81.
KERR McGEE CORPORATION	Red Mountain	Sulfide		0.71	Pub. 1970 100 million tons possible
KEYSTONE MINERALS INC.	Korn Kob	Oxide	8	0.50	Pub. in "Pay Dirt" July 1973

TABLE XXIII (Cont.)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
MAGMA COPPER COMPANY	Copper Creek	Sulfide			
	Kalamazoo & San Manuel	Sulfide	221 proved	0.72	Published 1984 E&MJ International Directory
		"	456 probable	0.70	
		Oxide	205 possible	0.70	
	Superior	Sulfide	3.3 proved	5.80	Published 1984 E&MJ International Directory
			1.1 probable	5.20	
			0.07 possible	4.70	
	Vekol Hills	Sulfide	105	0.56	Pub. 1978, minable by open pit; with 0.014% Mo; 16 million tons oxide Cu.
McALESTER FUEL CO.	Zonia	Oxide	20.5	0.53	Pub. in 1980 E&MJ International Directory
NAVAJO TRIBE (?)	White Mesa	Oxide	2	0.75	Pub. 1955
NORANDA LAKESHORE MINES INC.	Four Metals	Sulfide	3	0.82	Reported 1965
	Lakeshore	Sulfide (Porphry)	41	0.65	Published in Noranda's 1983 Annual Report
	Lakeshore	Sulfide (Tactite)	8.9	1.35	Published in Noranda's 1983 Annual Report
	Lakeshore	Oxide	13.1	1.16	Published in Noranda's 1983 Annual Report
	Ventura	Sulfide	6.3	0.26	Reported 1965; with 0.28% MoS_2
ORACLE RIDGE MINING PARTNERS	Oracle Ridge	Mixed (?)	11	2.25	Reported 1977; with 0.64 oz. Ag/ton. Published 1979.
S.B. OWENS	Carlota	Oxide	4	0.85	Reported 1979

TABLE XXIII (Cont.)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
PHELPS DODGE CORPORATION	Copper Basin	Sulfide	175	0.55	Pub. 1974; minable by open pit with 0.02% Mo.
	Copper Queen	Mixed			
	Lavender	Sulfide			
	Morenci	Sulfide	869.2	0.76	1983 Form 10-K Annual Report
	New Cornelia	Sulfide	214.1	0.50	1983 Form 10-K Annual Report
	Safford	Mixed	262.400	0.88	1982 Form 10-K Annual Report
	United Verde	Sulfide			
	United Verde	Oxide			
RANCHERS EXPLORATION & DEVELOPMENT CO.	Bluebird	Oxide	65	0.53	Pub. in Ranchers' 1981 Annual Report
V.B. SMITH ESTATE	Dynamite	Sulfide			
SQUAW PEAK MINING CO.	Squaw Peak	Sulfide	30	0.35	Unpublished estimate.
STANDARD METALS CORP.	Antler	Sulfide	5.1	1.95	With 4.13% An, 0.94% Pb, and 1.05 oz Ag/ton. Pub. in 1978 Annual Report & Form 10-K.
STRONG & HARRIS	Strong & Harris	Mixed	60	0.60	Unpublished estimates with 0.70% Zn.
SUPERIOR OIL	Pine Flats	Sulfide	12	0.50	Unpublished estimate.
UNDETERMINED	Mineral Hill	Mixed			

TABLE XXIII (Cont.)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
UNION OIL	Turquoise	Oxide	10	0.50	Published in 1975
UNITED STATES GOVERNMENT	Park Hill	Mixed (?)	30	0.45	Unpublished estimate
UNITED STATES GOVERNMENT & U.S. METALS CORP.	Apex	Mixed (?)			
VAN DYKE COPPER CO. & SHO-ME COPPER CO.	Van Dyke	Oxide	100	0.50	Published 1977.

1/ Reserves are given with a grade of average total copper content as of December 31, 1983, unless stated otherwise under "Remarks". As used in this table, reserves generally mean those estimated quantities of ore which, under present and reasonably forseen technical and economic conditions may be profitably mined and sold or processed for the extraction of their constituent values.